flow

Material Handling • Production • Automation • Packaging • Shipping

MAY 1955

MATERIAL HANDLING AND THE NATIONAL ECONOMY 1955-1965

NOELTING **Faultless** **CASTER**

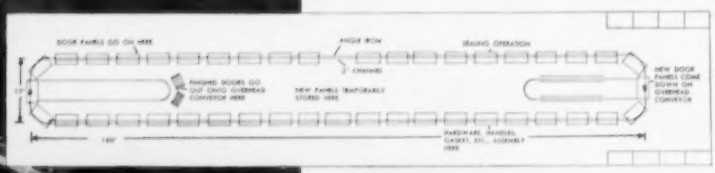
MATERIALS HANDLING FACTS

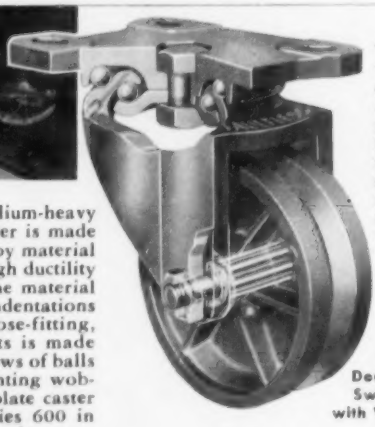
No. 7 in a series of Caster Achievements for men in industry

HOW 10 HANDLING OPERATIONS AND COSTS ARE ELIMINATED AT INTERNATIONAL HARVESTER'S EVANSVILLE PLANT

The installation of 43 door-panel assembly trucks at International Harvester's Evansville plant may reduce handling costs by 15%. Employees enjoy comfort of being able to work around door-panels that are automatically brought to their stations at convenient height for quality workmanship. Faultless 606-4V and 806-4 Series casters assure continuous operation of these trucks.

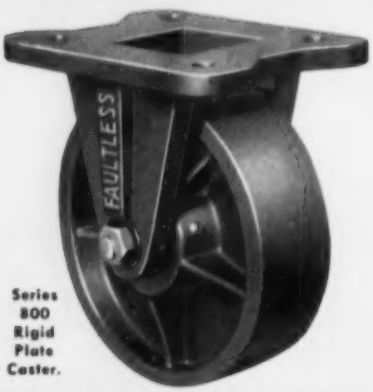
(below) Obstruction-free angle iron track and 2" channel automatically guide casters around long oval. All units are power driven at rate of 13½ feet per minute from under-floor pit. International Harvester Company engineers estimate a 15% reduction in handling costs from installation of this new door assembly handling system.





The V-grooved wheel automatically follows the angle iron track production line. Ten handling operations were eliminated with the installation of this new caster and track system.

Series 600 Double Ball Bearing Swivel Plate Caster with V-grooved Wheel



Series 800 Rigid Plate Caster.

The Series 600 Faultless medium-heavy duty swivel plate truck caster is made of a special high tensile alloy material for extreme strength and high ductility to withstand shocks. Yet the material is hard enough to resist indentations from the ball bearings. Close-fitting, precision assembly of parts is made possible by two complete rows of balls filling raceways and preventing wobble. The Series 800 rigid plate caster is a companion to the Series 600 in overall height and load capacity.

This is another unusual material handling achievement for men in industry, made possible by Faultless Casters. Competent engineers, a modern factory, and skilled personnel combine to furnish you the dependable casters you need for your individual operation. Factory trained representatives and selected distributors are on call to help solve your material handling problems, no obligation.

FAULTLESS CASTER CORPORATION

EVANSVILLE 7, INDIANA

Offices in Atlanta, Boston, Buffalo, Chicago, Cleveland, Dallas, Detroit, Grand Rapids, High Point, Houston, Indianapolis, Los Angeles, New York, Philadelphia, St. Louis, Canadian Steelfloyd, Ontario

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It's the Revolutionary Automatic

DYNAMOTIVE

At last a fork lift truck that combines all the major advantages of both gas and electric operation! The gas powered *Automatic Dynamotive* has a special electric transmission that does away with clutch, gearshift, hydraulic torque converter and overdrive. Top performance features include foot operated lift and tilt, interlocked dual brake system, "inching" control and many others. Minimum down time. Maximum accessibility. No aisle projections.

The Dynamotive costs as little as $3.18 a day to lease or can be financed for deferred payments through the easy Automatic Earn-Its-Own-Way Plan.

Designed by
ULINSKI
Styled by
SAKHNOFFSKY

The Automatic Dynamotive line now covers a full range of capacities from 4,000 to 10,000 lbs.

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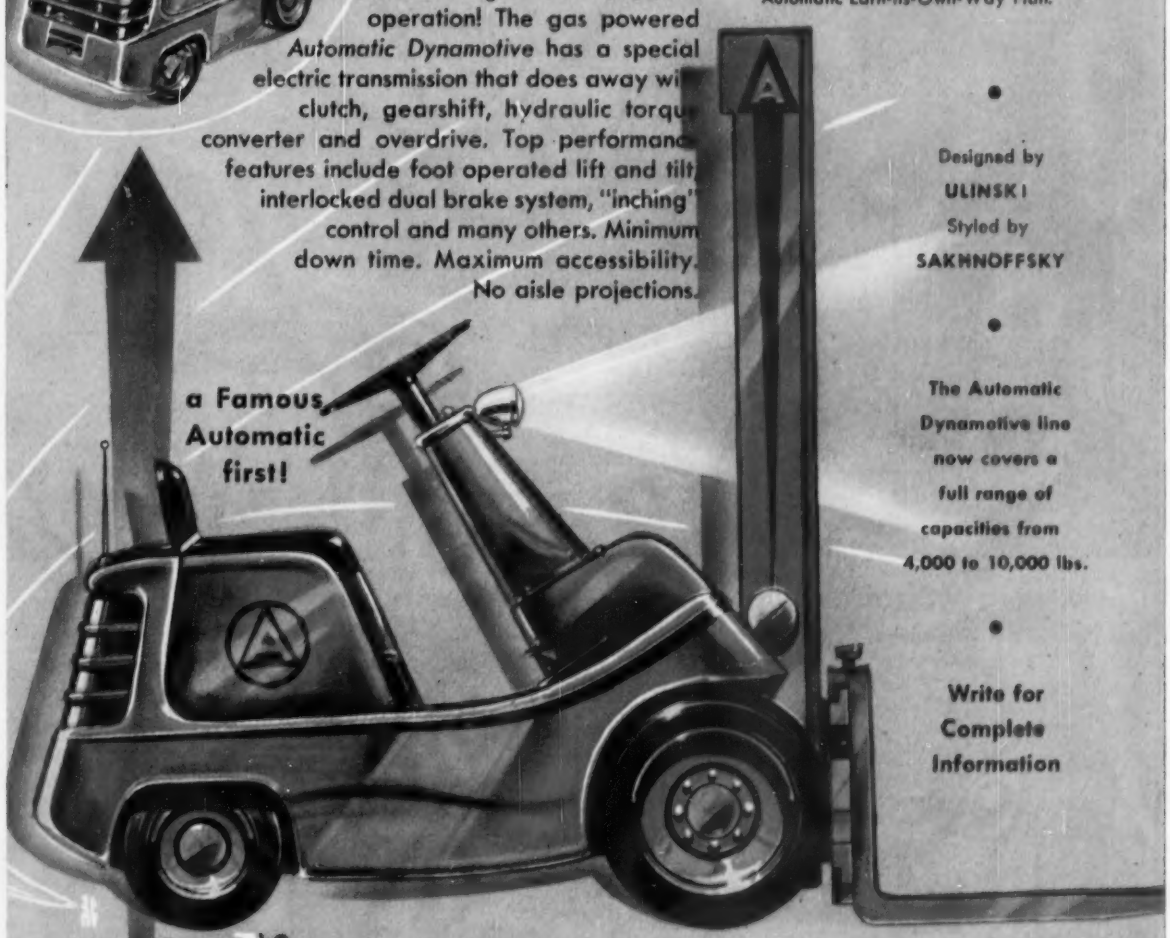

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Shown below are several of the practical aids provided to assure you quick and economical service on Vickers Hydraulics.

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Our service men will study your situation and make practical recommendations on your spare parts inventory . . . will check your inventory and provide you with printed lists of parts usually required.

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7143

ENGINEERS AND BUILDERS OF OIL HYDRAULIC EQUIPMENT SINCE 1921

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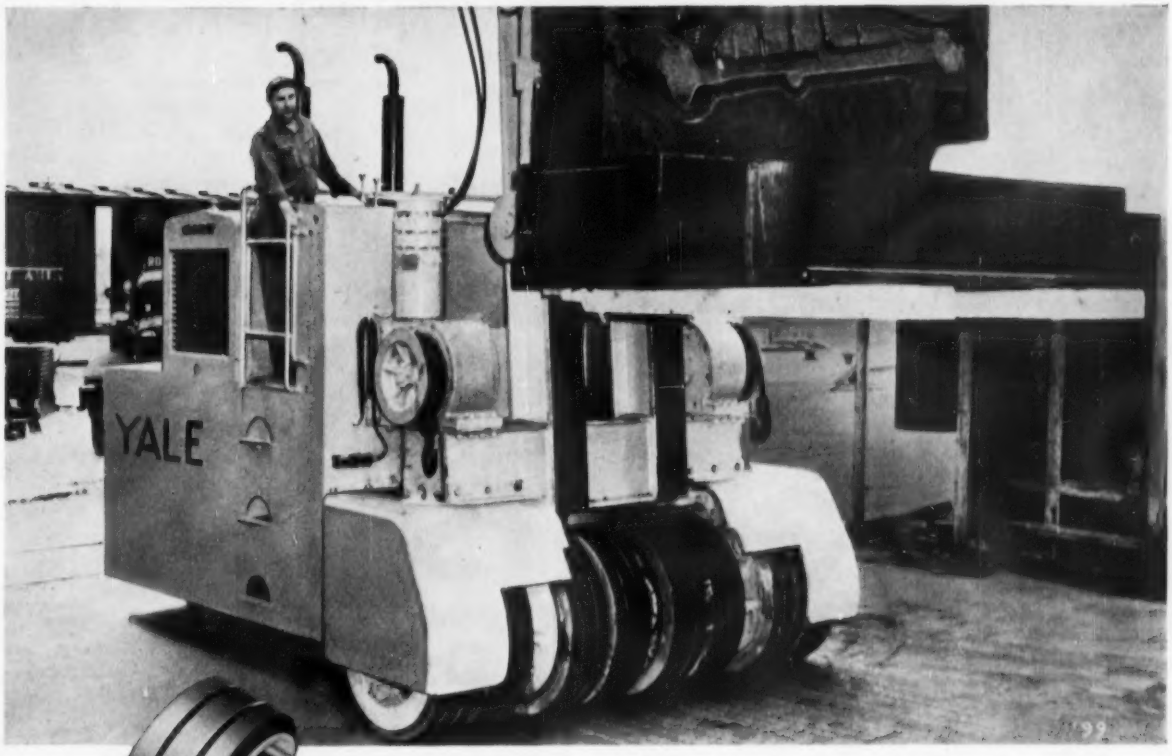
Roll up maximum tire performance



Groove Tread Solid

All-Service Tread Xtra Cushion

All-Weather Tread

Rib All-Weather Pneumatic (Tubeless or Conventional)

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USE THE RIGHT TIRE FOR THE JOB—USE

GOODYEAR

INDUSTRIAL TIRES

All-Service, All-Weather, Xtra Cushion—T.M.'s The Goodyear Tire & Rubber Company, Akron, Ohio

GOODYEAR TIRES

Look for this sign; there's a Goodyear dealer near you.

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NEW! LETOURNEAU ELECTRIC HOIST and JIB CRANE

Built for Your

BIG LIFTS

With Instant "Inching" Control!

LeTourneau Electric Hoists give safe, absolute control of any rated load. When power is applied, you'll have instantaneous, full-torque starts from the LeTourneau Electric Motor. Cut the power and mechanical-electrical three phase brake instantly stops and holds the load. Regenerative braking controls the lowering of the load. Big loads can be moved a fraction of an inch at a time for perfect positioning. All welded steel construction; available with all standard mountings. Three tons to 30 tons and *UP!*

LeTourneau Jib Cranes reach out 25 feet in all directions to pick up, move, and spot your load. Boom rotates 360° on roller bearings and in bronze-lined ball socket for smooth, easy manual operating – even with capacity loads. From 6 to 15 tons capacities. Boom clearance, 14½ feet with maximum overhead clearance of 18 feet, 2 inches. With or without hoist.

You owe it to your factory to get complete information on LeTourneau Jib Cranes and Hoists – write today for Bulletin 618.

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R. G. LETOURNEAU INC

LONGVIEW, TEXAS, U. S. A.

R. G. LeTourneau, Inc.
2636 South MacArthur, Longview, Texas, U. S. A.

- ☐ Please send me Bulletin 618 on LeTourneau Hoists
- ☐ Please send me information on LeTourneau Jib Cranes
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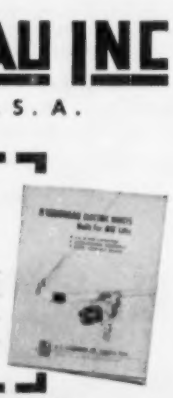

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STAFF

President and Publisher
IRVING B. HEXTER

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Franchise Managers
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REGIONAL OFFICES

All communications should be addressed to FLOW Magazine, 1240 Ontario Street, Cleveland 13, Ohio.

Cleveland Office
F. P. MIGNIN, MGR.
DAVID E. SAWYER
1240 Ontario Street
Cleveland 13, Ohio
Phone SUperior 1-9622

New York Office
LEE HAAS, DISTRICT MGR.
NORMAN B. HASSELRIIS
Room 803, 60 E. 42nd St.
New York 17, New York
Phone Murray Hill 7-3420

Chicago Office
LLOYD WILLOUGHBY, MGR.
CHARLES F. GEYER
Suite 1613-1615, 520 N. Michigan Ave.
Chicago 11, Illinois
Phone WHitehall 3-1655

Los Angeles Office
ALAN CAZIER
Room 1003, 3460 Wilshire Blvd.
Los Angeles 5, Calif.
Phone DUnkirk 9-9364

London Office
JOHN A. LANKESTER
31 Palace St., Westminster
London S.W. 1, England
Phone Victoria 2608

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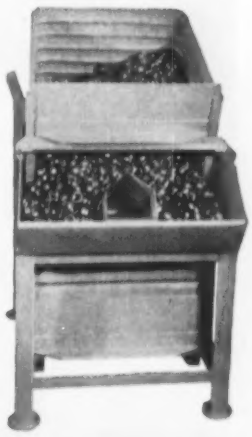
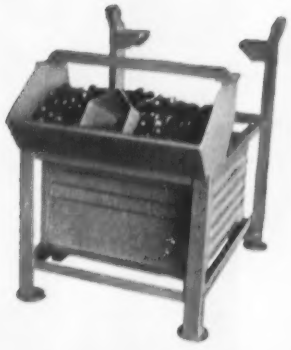
Circle No. 12 on Reader Service Card →

AT LAST! Really Automatic Materials Handling...

IMPROVED PRODUCTION OF MACHINE OPERATORS INITIAL INSTALLATIONS SHOW SENSATIONAL SAVINGS IN HANDLING TIME—



Work receiving box in same stand conserves floor area.



Big hopper holds work supply during box changing.

Here's materials handling history FLOW-MATION* by Powell—the greatest innovation in materials handling in a decade.

Your standard lift truck—no special attachments needed—sets a FLOW-MATIC* box on a special rack. The box opens under its own weight, discharging contents into work level hopper. Operator drops finished piece through chute into hopper to second box below. It's as simple as that.

Those who have seen it in action agree—there's nothing like it for cutting production time, reducing handling hours, lowering operator fatigue, conserving floor space—for saving you time and dollars. But get the entire story. See your Powell representative. He has full literature and working models. Or write direct to Powell for your copy of Powell FLOW-MATION* Systems, a specially prepared pamphlet that explains the entire system.

*FLOW-MATION and FLOW-MATIC are trade names of Powell Pressed Steel Co.—Product Patent Pending.

POWELL PRESSED STEEL Since 1930

flow-mation* Systems

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I would like a copy of FLOW-MATION*, the illustrated pamphlet that gives full details of the new Powell FLOW-MATION* System.

Name _____

Title _____ Company _____

Address _____

City _____ State _____

BIG JOE

BIG JOE MANUFACTURING COMPANY 900-08 Jackson Blvd., Chicago 7, Illinois

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May, 1955
Vol. 10, No. 8

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FLOW is published monthly by The Industrial Publishing Group, a Division of Telenews Products, Inc., which also publishes:

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FLOW'S MATERIAL HANDLING ILLUSTRATED
PRECISION METAL MOLDING
APPLIED HYDRAULICS
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WELDING ILLUSTRATED
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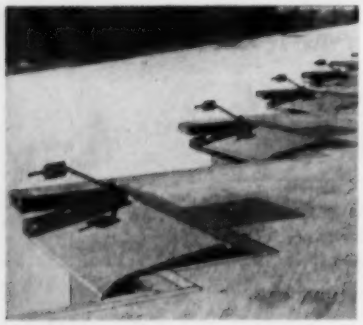
RITE-HITE ADJUSTABLE LOADING RAMPS

- CUT CROSS-DOCK TRAFFIC CONFUSION
- REDUCE DAMAGE TO MERCHANDISE
- MAKE HANDLING SAFER
- ASSURE FULL USE OF DOCK CAPACITY
- REDUCE TURN-AROUND TIME OF TRUCKS
- SPEED LOADING AND UNLOADING, CUT COSTS

3 TYPES, 8 MODELS Capacities: 10,000 and 20,000 pounds

Precision counterbalanced. Simple mechanical design assures smooth, dependable operation regardless of weather conditions. No pumps, pipes, motors or gears. Little or no maintenance needed.



PERMANENT TYPE RAMP becomes an integral part of the loading dock. One-man operation. Can be installed in new construction or existing docks at low cost. Can be modified at no extra cost to provide clearance for overhead doors when ramp is in raised position. Horizontal adjustment reduces truck maneuvering.

SELF-CONTAINED DOCK AND RAMP for nonpermanent installation. Ideal for leased buildings—easy to move to new location. Has the same rugged dependability, operating smoothness and efficiency for which all Rite-Hite adjustable loading ramps are noted. Horizontal adjustment reduces truck maneuvering.

FLUSH-TYPE RAMP for permanent installation. When not in use can be locked in position flush with loading dock surface. Dock traffic can travel over it freely because there are no protruding levers or skirts. Features the same ruggedness and smooth operation common to all Rite-Hite Loading Ramps.

SPECIFICATIONS

Model	48-PU*	60*	48-STD*	48-U	48-F	72*	72-F	72-U
Capacity, tons	5	10	10	10	10	10	10	10
Reach, in.	48	60	48	48	48	72	72	72
Width: Dockside, in.	42	60	78	78	72	78	72	78
Width: Carrier side, in.	42	60	72	72	72	72	72	72
Horizontal Adj., in.	None	None	14	14	None	14	None	14
Shipping Weight, lbs.	1200	2100	1900	2250	2100	2800	3300	3750

*These models have counter-weight suspended behind the ramp. They can be modified so ramp swings up to within ten degrees of vertical, permitting overhead doors to be closed in front of ramp.

Investigate RITE-HITE Adjustable Loading Ramps for your loading dock operations.

RITE-HITE DIVISION

LOOMIS MACHINE COMPANY

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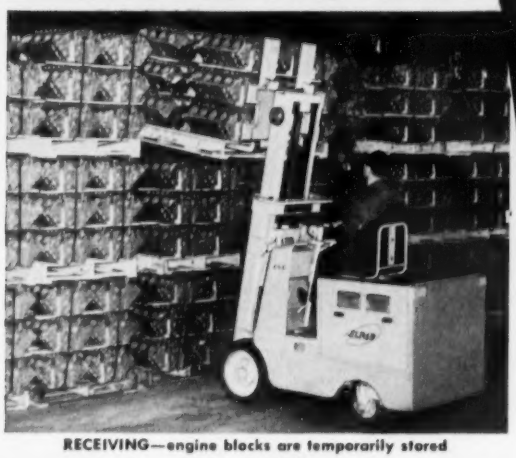
ELPAR truck stacks completed Packard engines four to a rack

dependability of ELPAR trucks pays off at Packard



RECEIVING—engine blocks are temporarily stored on arrival at plant

SHIPPING—ELPAR truck places completed transmissions in a road truck

On Packard's modern automatic production line, split second delivery of material is a "must". Removal of completed units must be equally speedy. ELPAR electric fork trucks help on these vital jobs. Truck breakdowns would lead to costly bottlenecks in the entire operation. But ELPAR trucks stay on the job, helping Packard achieve synchronized production at all times.

The fact that 66% of the 75 largest U. S. manufacturing companies use ELPAR trucks is proof of their dependability. Built to match the finest machinery in any plant, ELPAR trucks give years of steady low cost service. If you want to know more about industrial trucks "built up to a quality, not down to a price", write for the ELPAR catalog.

THE ELWELL-PARKER ELECTRIC COMPANY
4235 St. Clair Avenue • Cleveland 3, Ohio

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THE MOST FLEXIBLE of the standard six-strand hoisting ropes is needed for this ladle crane—that's Tiger Brand 6 x 43 Filler Wire Rope. A tough independent wire rope core resists heat and adds strength.

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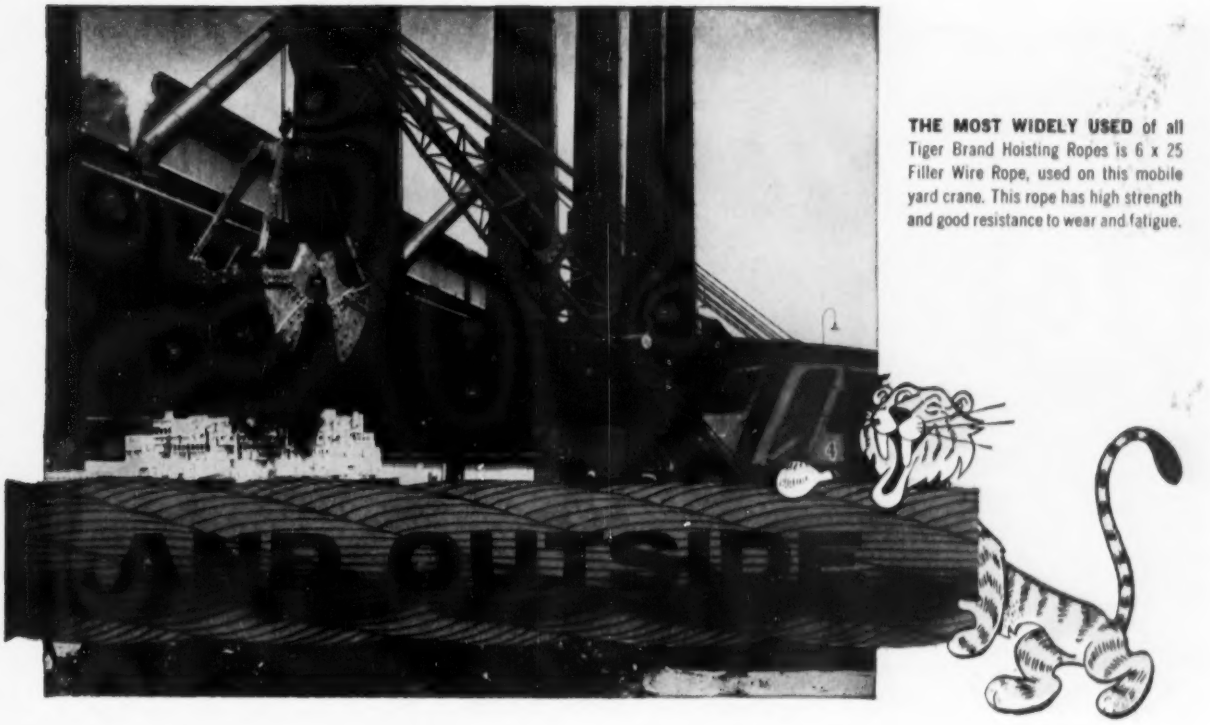

THE MOST WIDELY USED of all Tiger Brand Hoisting Ropes is 6 x 25 Filler Wire Rope, used on this mobile yard crane. This rope has high strength and good resistance to wear and fatigue.

TIGER BRAND

FITS THE JOB!

WHETHER YOU NEED a wire rope for a ladle crane, a yard crane, a skip hoist, a winch, a sling, a guy line, or any other job, you will find a Tiger Brand Wire Rope that's especially suited to the job.

Both the inside and outside of every Tiger Brand Wire Rope is made for a particular type of service. Take a ladle crane for example. Its hoist rope slaves away over a white hot steel furnace day after day. A strong, tough, heat resistant core is needed. For that reason, Tiger Brand Ropes for this service are built with independent wire rope cores.

These ropes must be flexible too, so the strands are formed from a large number of wires. This enables them to flex and bend easily, repeatedly, without danger of fatigue failure.

Other ropes need completely different properties. Quite often, a fiber core is preferable to any other type. Sometimes the outside wires must be unusually heavy gauge to withstand abrasion. And then there's the matter of lay, and preforming, and the grade of steel. Every rope job is special. If you are ever in doubt about which rope is best for a job, about how much service can be expected from a rope, about how to increase service, call in a Tiger Brand Wire Rope Engineer—he knows the answer. Just call your Tiger Brand Distributor.

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COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO • TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA., SOUTHERN DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS AMERICAN TIGER BRAND WIRE ROPE

Excellay Preformed

UNITED STATES STEEL

SAVING $5,460 PER YEAR resulted in this brick manufacturing plant when this TENNANT Power Sweeper was put to work picking up little "brickbats" on the run.

how to sweep up an acre of "BRICKBATS" IN 2 HOURS!

This Cleveland plant was bothered by "brickbats"—little knife-sharp brick chips that gouged lift truck tires, slowed traffic and increased handling costs.

Sweeping up the brick chips with handbrooms didn't work, because it raised dense clouds of choking dust. And while a portable vacuum sucked up the dust, it left the chips. To do both jobs would have required at least 16 manhours a day.

Today, with a TENNANT *vacuum-equipped* Power Sweeper, they pick up both "brickbats" and dust in a single operation, covering the entire area of 45,000 sq. ft. in 2 hours.

They not only save truck tires and reduce dust concentration, but save 14 manhours a day on the complete job. *WRITE TODAY for details about the cost-saving performance of heavy duty Tennant Power Sweepers. Many types and sizes.*

Tennant Model 24 rapidly sweeps concrete floors in huge warp mercerizing department at Coats & Clark Co. plant in Toccoa, Georgia.

G. H. TENNANT CO.
2576 N. 2nd Street, Minneapolis 11, Minn.

TENNANT POWER SWEEPERS

SPECIALIZED MAINTENANCE EQUIPMENT

Circle No. 275 on Reader Service Card for more information

Wants Scale Details

To FLOW:

Your article, "Guesswork Eliminated at Ford with Fork Truck Scales", which appeared in the December 1954 issue of FLOW magazine was quite thought provoking. In fact, it raised some questions in our minds which we hope to have answered with your help. If you could, therefore, supply us with the name of the person or persons at Ford Motor Company's River Rouge Plant who could be contacted for more information about the Martin-Decker Fork Truck Scales applications described in the article mentioned above, we would be greatly appreciative.

Thank you for your cooperation.

Mrs. Mary B. Cassata
Trico Products Corp.
Buffalo 3, New York

Details on the operation in question may be obtained from O. S. Snyder, General Foreman, General Stores, Shipping and Receiving Services, Manufacturing Services Division, Ford Motor Company, Dearborn, Michigan.

Better Beer Handling By Blatz, By Golly!

To FLOW:

In the July 1954 issue of FLOW you had a very interesting article on material handling by the Brewers' Warehousing Company, Ltd. of Toronto, Canada. They seem to have solved several problems on rail shipments of beer on which we are working. Can you tell me whom I can contact to obtain answers to the following:

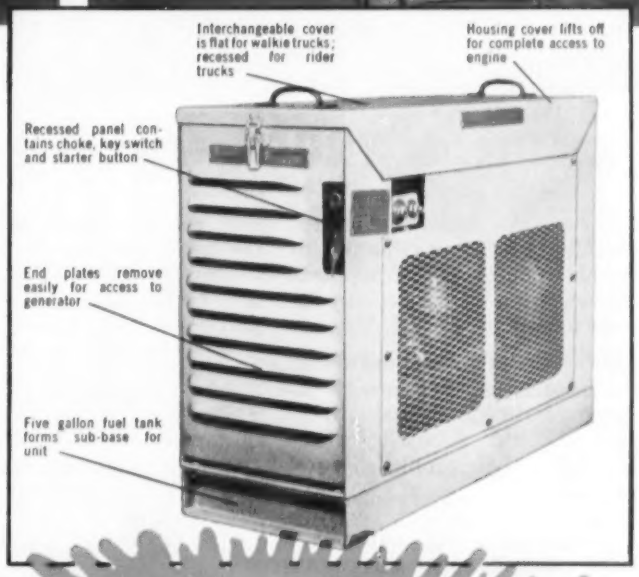
1. What method they use for bonding or tying individual cases in the pallet loads to

Everything is NEW on this BANTAM

Ready-Power Gas-Electric Power Unit

FOR MOTORIZED WALKIE TRUCKS

FOR RIDER TRUCKS UP TO 2000 LBS.


Interchangeable cover is flat for walkie trucks; recessed for rider trucks
Housing cover lifts off for complete access to engine
Recessed panel contains choke, key switch and starter button
End plates remove easily for access to generator
Five gallon fuel tank forms sub-base for unit

new PERFORMANCE

Quick, positive starts are assured with new 12-volt automotive-type starting and ignition system. *Complete choice of idling speeds* is yours because truck contactors are battery energized. New positive type governor.

new ACCESSIBILITY

Just lift the top cover and all engine accessories, controls and instruments are within easy reach. Louvered end plate can be removed in minutes for complete access to generator.

new VERSATILITY

The Ready-Power bantam model "W" is designed with *no projections*. It fits practically all makes and models of walking and small riding-type electric trucks. Interchange from truck to truck presents no problem.

Here's the most foolproof, most compact, most dependable power generating unit ever built for small truck use! Months of job testing have proved that it is ideally suited for all the jobs that small trucks must do. Ready-Power gives your trucks full electric power all the time with no fatigue, no letdown. Put it to work for you soon!

TRIAL OFFERED

IN YOUR PLANT—ON YOUR TRUCK

See the new Bantam Model W in action, right in your plant. A Ready-Power sales engineer will arrange all the details. Fill in and mail this coupon.

the All New

READY-POWER

BANTAM MODEL W

The READY-POWER Co., 3838 GRAND RIVER AVE., DETROIT 8, MICH.

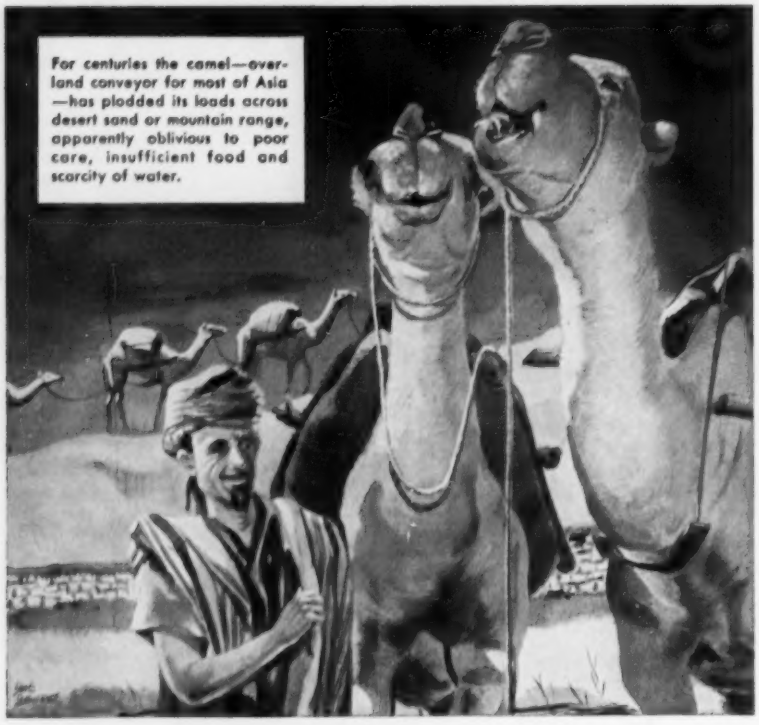
Manufacturers of Gas and Diesel Engine-Driven Generators and Air Conditioning Units; Gas and Diesel-Electric Power Units for Industrial Trucks

THE READY-POWER COMPANY
Detroit 8, Michigan

Gentlemen:
I am interested in your new Bantam Model W.
☐ Please send complete information.
☐ Please arrange a trial in my plant.

Company_____
Address_____
City_____ State_____
Signed_____ Title_____

Circle No. 8 on Reader Service Card for more information


For centuries the camel—overland conveyor for most of Asia—has plodded its loads across desert sand or mountain range, apparently oblivious to poor care, insufficient food and scarcity of water.

MASTERS OF **TOUGH** CARRYING JOBS

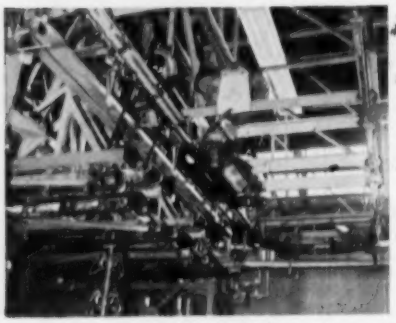
It is a far cry from this ancient camel-back conveyance to the ingenious Automation Equipment conceived and built especially for modern industry.

Today—many manufacturers, who have been plagued with inefficient, outmoded material handling equipment, look to *Allied* for solving their problems, however complex.

You, too, can depend on *Allied* for the perfect solution to your particular conveyor problem. Their long-time experience, engineering know-how and fabrication facilities can be yours on request.

See for yourself why *Allied* Conveyor Units, mile-long Conveyor Systems or Specialized Handling Machines are recognized *masters of the toughest carrying jobs!*

cation of fully automatic material handling systems
PIONEERS IN AUTOMATION . . . *the design and fabri-*



One type of custom built, special purpose material handling system engineered by Allied is this plating and dipping installation that includes several conveyors, separately driven at different speeds, and provides two automatic load transfers.

For further information request Allied Catalog 953

ALLIED AUTOMATION DIVISION
ALLIED STEEL and CONVEYORS, INC.
17315 Healy Avenue, Detroit 12, Michigan
Circle No. 26 on Reader Service Card for more information

LETTERS

Continued

keep the cases from moving.
2. How are pallets prevented from shifting in the car.
3. What type of wheels they have on their pallet trucks that permit easy movement over the slatted floors of refrigerator cars and have low enough weight distribution per wheel to prevent breaking the floor slats.

We are very interested in obtaining answers to these questions and will appreciate any help you can give us.

The same issue of FLOW had an article on material handling here at Blatz. Although the system is comparatively new and is completely satisfactory for conditions as they existed when it was designed, we are finding it necessary to modify the system in order to meet changing conditions in the industry and new handling methods.

J. E. Grant
Blatz Brewing Company
Milwaukee, Wisconsin

The article which appeared some nine months ago was developed by G. R. McConvry of McConvry-Mudge Ltd., Toronto, Canada. We have accordingly referred Reader Grant's letter to Mr. McConvry for an authoritative answer.

Box Car Unloading Problem

To FLOW:

Will you please recommend equipment or a system which will remove English China and Ball Clay from box cars? We need something, relatively inexpensive, that will do the job quickly and with minimum manual effort.

A. M. Morris
Plant Engineer
Ohio Brass Company
Cleveland, Ohio

Perhaps some of our readers who have had experience with this type unloading will be able to suggest an inexpensive method of unloading to Reader Morris.

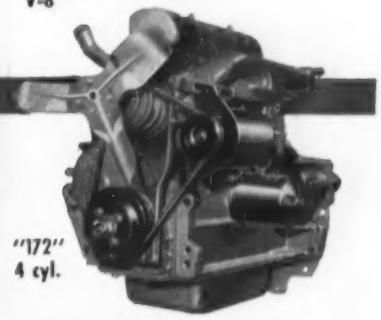
Most modern development in industrial engine design in 23 years... FORD Short Stroke ENGINES

Something revolutionary has happened to Ford Industrial Engines—that's ultra-modern Short Stroke design. With these advanced Short Stroke engines the *stroke* (distance the pistons travel up and down) is as short as, or shorter than the *bore* (cylinder diameter). This results in less piston travel . . . slower piston speeds . . . less wear, less friction . . . and, therefore, tests show Ford Short Stroke engines deliver *MORE USABLE POWER!*

On the total piston travel it takes to operate old-style long-stroke engines only 100 hours, a Ford Short Stroke engine will operate as long as 155 hours. It is equivalent to getting *55 extra working hours "for free"!*

So why settle for an outdated long-stroke engine when you can get a gas-saving, longer-lasting, Ford Low-Friction Industrial Engine for your material handling equipment.

"317" V-8



"172" 4 cyl.

Knickerbocker "truck-man" uses Ford Power

Gerlinger Carrier uses Ford Power

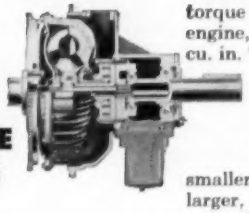
Coles Crane uses Ford Power

Hughes-Keenan uses Ford Power

PARTIAL LIST OF MATERIAL HANDLING APPLICATIONS USING FORD POWER

CRANES • CONVEYORS • ELEVATORS
FORK LIFTS • TRUCKS • HOISTS • LOADERS
SHOVELS • WINCHES • YARDERS
STRADDLE CARRIERS • SIFTERS • LIFTS
LOGGERS • EXCAVATORS • DRAGLINES
DREDGES • TRENCH HOES
AND MANY OTHERS

New **FORD TORQUE CONVERTERS**



Ford now offers a full range of torque converters—one for every size engine, from the 134 cu. in. to the 317 cu. in. Torque converter drive featuring fluid drive *plus torque multiplication* is especially advantageous to material handling applications, for in many instances it enables a smaller engine to do the job of a larger, more expensive engine at lower operating cost.

SEE . . .
FORD Short Stroke ENGINES
at the
NATIONAL MATERIALS HANDLING EXPOSITION IN CHICAGO
May 16 through May 20
BOOTH 1429

INDUSTRIAL ENGINE DEPARTMENT
FORD MOTOR COMPANY
P.O. Box 598, Dearborn, Michigan

Ford
INDUSTRIAL ENGINES AND POWER UNITS

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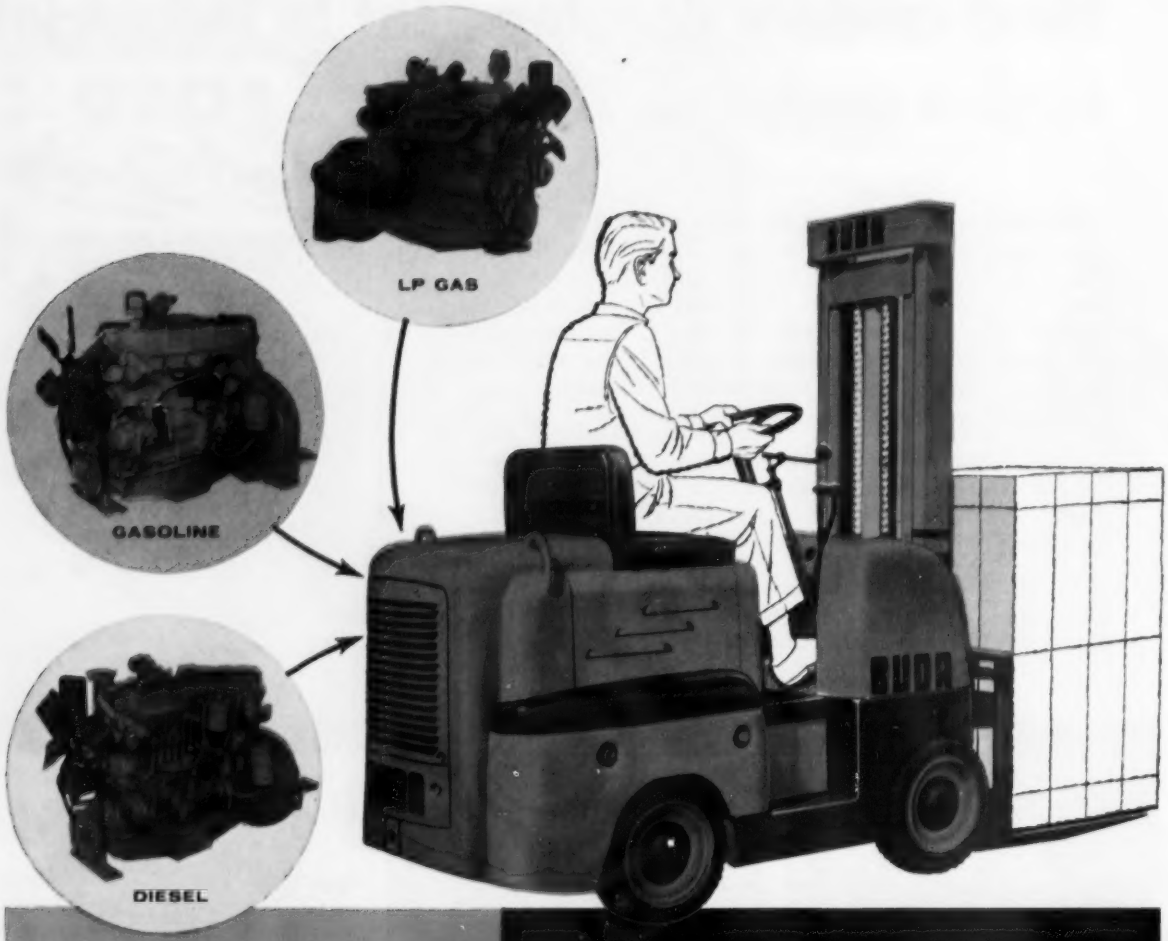

BUDA

IS THE ONLY FORK LIFT TRUCK MANUFACTURER TO BUILD ITS OWN ENGINES – DIESEL, GASOLINE AND LP GAS

COMPLETE DETAILS IN FREE BOOK!

See why Buda is the safest, most maneuverable, most economical fork lift truck in the field. Write today for your free copy of the Buda Facts Book.

Only Buda builds its own engines . . . and *only* Buda can provide a heavy-duty industrial type longer life, more costly engine *at no extra cost* to you! Only with Buda do you have 85% interchangeability of engine parts resulting in easier servicing, lower maintenance costs. Buda Diesel, gasoline and LP gas engines provide 30% longer life, less down-time, greater economies. Buda *Diesel* engines have proven fuel savings of up to $500.00 a year. Remember, too, that every Buda engine is backed by complete, one-source responsibility in the plant or field, in warranty or in service by Buda . . . a division of Allis-Chalmers!

THE BUDA DIVISION

Allis-Chalmers Manufacturing Company

Harvey, Illinois

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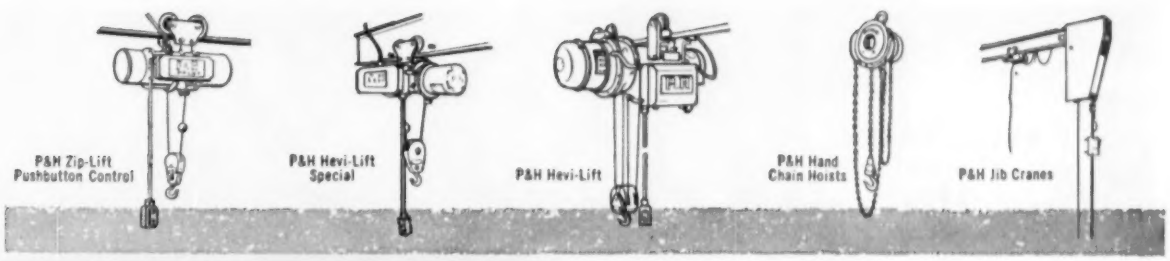
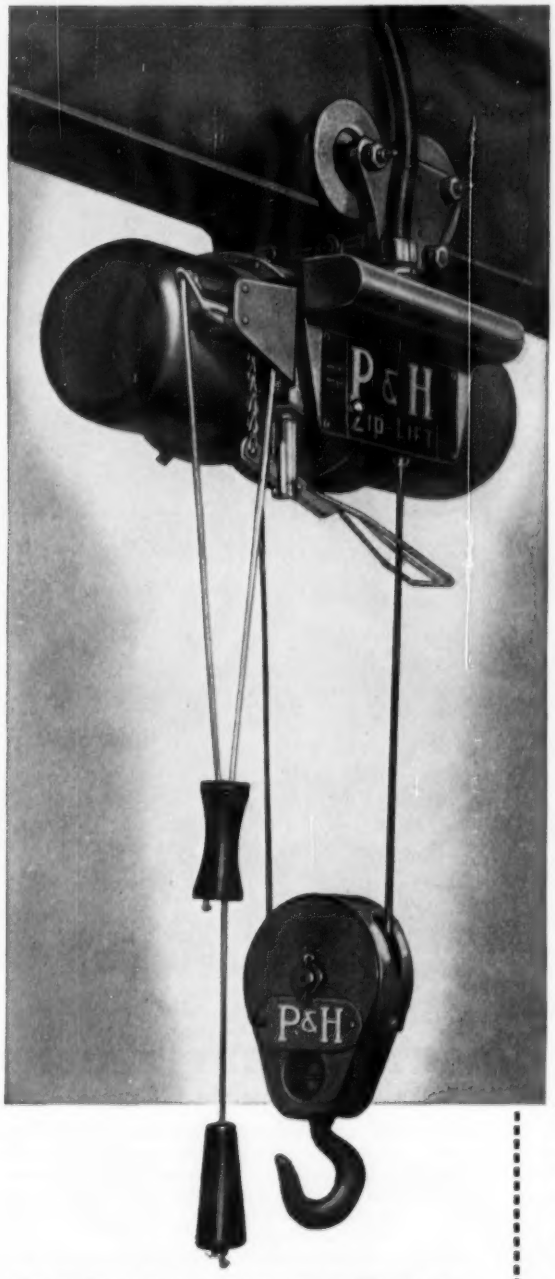




Your own good judgment will sell you

. . . on the hard-working, dependable advantages of a P&H Zip-Lift Special Hoist

There's one easy way we know to convert you from prospect into customer. Simply take the following factual statements and compare them with what competing brands of hoists offer you:

The P&H Zip-Lift Special is a rope-controlled, *wire-rope hoist* — yet it sells at electric chain hoist prices.

It has a safety factor of *five!*

The Zip-Lift Special is fully enclosed and weather-proofed. It has a lifetime-lubricated, ball-bearing, full-capacity motor.

The new drop-forged block is only one symbol of the famous P&H quality built into every Zip-Lift.

Now, check the advantages of competing hoists against this list. Then use the coupon below for complete information on this newest member of the P&H Hoist line. P&H Hoist Division, Harnischfeger Corporation, 4643 West National Avenue, Milwaukee 46, Wisconsin.

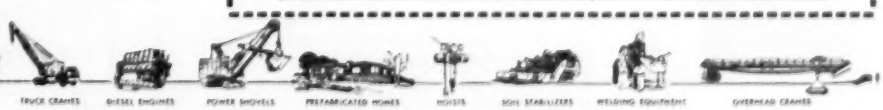
Tear out this coupon and mail today!

P&H HOIST DIVISION, HARNISCHFEGER CORPORATION 3022
4643 West National Avenue, Milwaukee 46, Wisconsin
Gentlemen:
Please send me the illustrated booklet, including specifications, on the new P&H Zip-Lift Special Hoist.

NAME .....
COMPANY ..... TITLE .....
ADDRESS .....
CITY ..... ZONE ..... STATE .....

HARNISCHFEGER

the **P&H** *Line*



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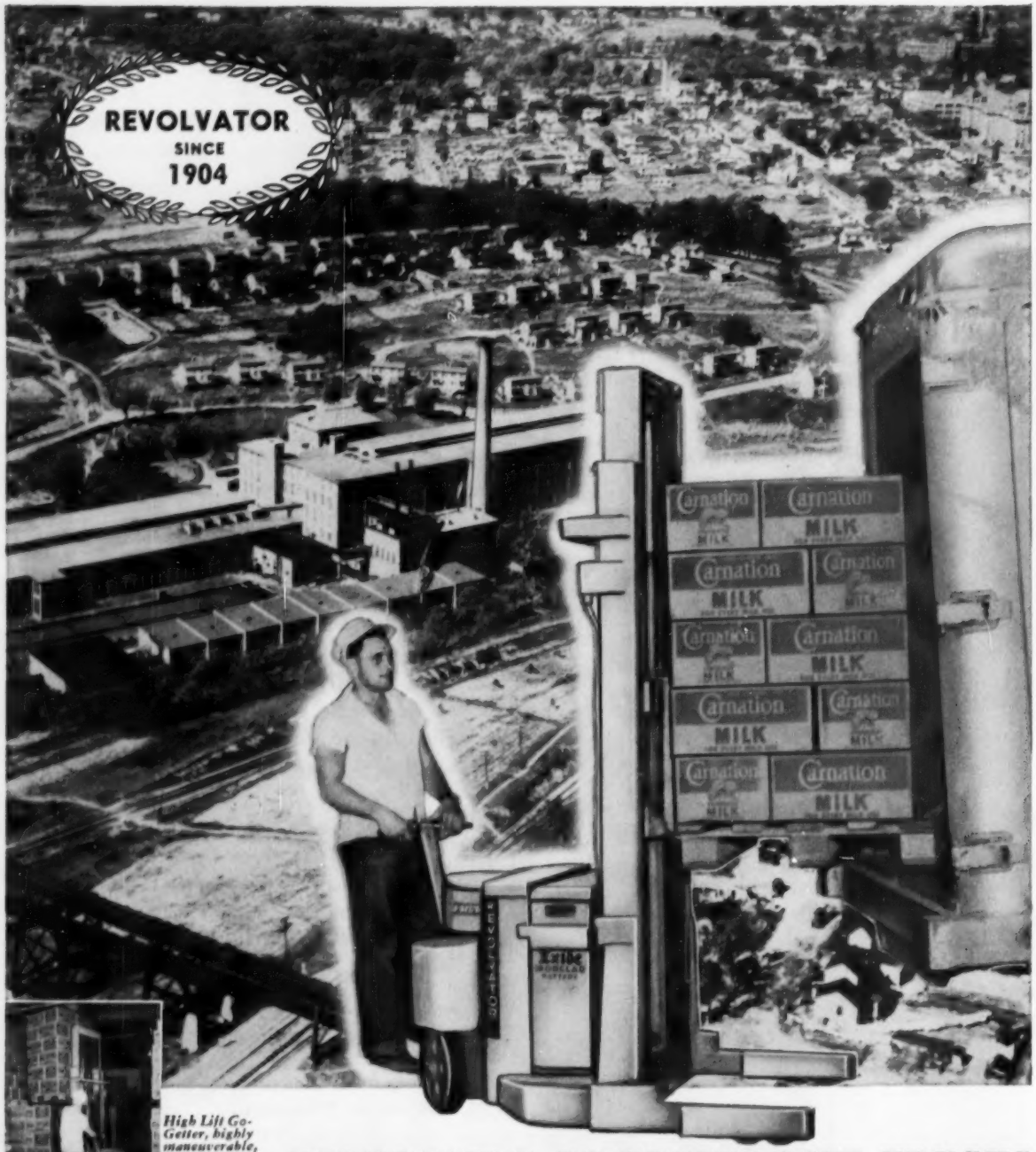


High Lift Go-Getter, highly manuevorable, a favorite of food producers, wherever narrow aisles and high stacking is required.

The same High Lift Go-Getter engaged in transporting goods from the warehousing operation to the shipping point — a real brute for work.

REVOLVATOR GO-GETTER LIFT TRUCKS

You Benefit By Over 50 Years of Diversified Experience

Thruout Industry Revolvator Go-Getter Lift Trucks have been used to solve a great range of materials handling problems. For manufacturers of heavy machinery—where area temperatures are high and loads are maximum; for packers of frozen foods with temperatures ranging from seasonally atmospheric to far below zero, Go-Getter Lift Trucks have proved their worth. No matter how different you may feel your requirements are, there is a standardized Revolvator Go-Getter ready to perform your most specialized requirements.

The quiet, smooth, powerful operation; the easy maneuverability; the freedom from heavy maintenance; the overall simplicity of construction of these Revolvator Go-Getters have made the name Revolvator synonymous with peak efficiency in materials handling.

Today write for full information.

REVOLVATOR CO.
8739 TONNELE AVE., NORTH BERGEN, N. J.

Circle No. 246 on Reader Service Card for more information

another 1st in Materials Handling

Cut Costs With The New

EMPIRE DRUM CLAMP

EMPIRE DRUM CLAMP:

- Fits Easily on *Any Fork Truck.*
- Lifts 6 full drums at a time to height of lift and transports them.
- Bear-Hugs Clamp over top of drums safely holds them.
- Automatically positions drums into alignment for clamp.
- Greater utilization of storage space because attachment requires no room between drums.
- Stacks and unstacks without disrupting the pile.
- Requires 1 man to operate.
- No pallets needed.

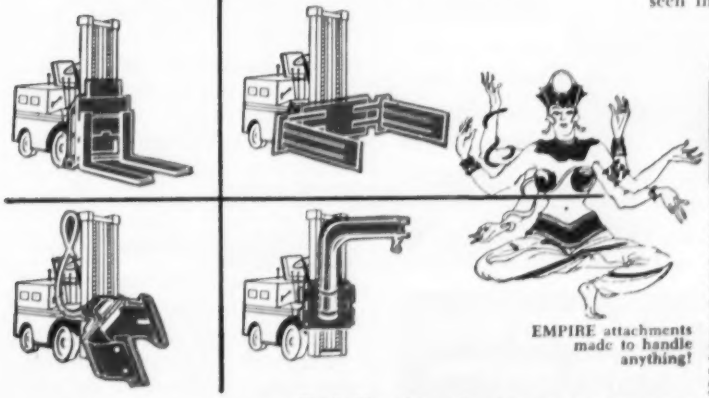
DEALERS: Cash in now on this revolutionary improvement in materials handling! Be the first in your area to offer the newest and most modern of Empire attachments. Every company will want them . . . anybody, in fact, who handles kegs, barrels or drums will need them! Some choice dealer franchises are still available. Contact us now!

Visit us at Booth 1633 — May 16 to 20, 1955 at the National Materials Handling Exposition International Amphitheatre, Chicago, Ill.

WRITE FOR EMPIRE'S FREE GUEST TICKETS

Why not 6 drums at a time?

Haven't you often asked yourself that question? We did too! So we sat down at our drawing boards and brought out the obvious answer — the Empire Drum Clamp, which handles SIX DRUMS OR BARRELS AT ONE TIME! What could be simpler arithmetic than this: You use *one-sixth* as many lift trucks to do your present handling job! Or, handle the Drums, Kegs or Barrels with your present equipment in *one-sixth* the time! Or, perhaps, with expanding operations in your plant, continue with your present equipment and handle *six times* as many drums as at present! Any way you look at it, it's money in *your pocket.* We also have bought out the Beer Keg Clamp and other new types of attachments seen in this ad.



EMPIRE attachments made to handle anything!

(Attach to your business letterhead and mail)

EMPIRE attachments and devices by

IRON WORKS INCORPORATED

116 King Street Dept-F-55
Brooklyn 31, N. Y.

Gentlemen: Please send me FREE catalog, price list and full information.

Name _____ Title _____

Address _____

City & State _____

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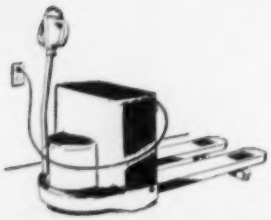
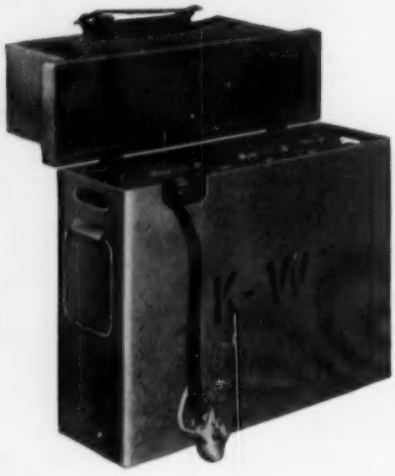


Charge it...anywhere!

with the *new* K-W complete power unit



Saves space!

No moving parts!

Cuts maintenance cost!

■ There's no need to tie up valuable floor space for battery charging when you use KW Complete Power Units on your "Walkie" type trucks. Simply plug unit (battery with permanently mounted charger) into any 110-120 V. 60 cycle outlet *anywhere . . . at any time truck is not in operation . . .* for a booster charge, or full charge *. . . without removing battery from truck!* The unit is automatic and fool proof in operation. There are no moving parts, no relays, no contactors, no timers to get out of adjustment. Rate of charge is automatically controlled, thus insuring positive protection to battery. Complete recharge overnight. Change now to KW Complete Power Units, and see the difference!

Write for free descriptive folder

SPECIFY this NEW K-W Power Unit on your next truck.

KW BATTERY COMPANY, Inc.
SKOKIE, ILLINOIS - BROOKLYN, NEW YORK

Circle No. 175 on Reader Service Card for more information

. . . at Link-Belt Speeder Corp.

Two new sales executives were named by President **D. W. Lehti.** Vice President of manufacturing and sales is **C. M. Basile,** and sales manager is **Gordon W. Rowand.** Both men have been associated with the company for a number of years, and they will headquarter in Cedar Rapids.

C. M. Basile

G. W. Rowand

. . . at Structo Systems

Edward L. Lee has been named general manager. Prominent in the industry, Lee was most recently sales manager of Saginaw Products Corporation. He has written and edited numerous manuals on material handling, and is a member of the Caster and Floor Truck Manufacturers Association, Michigan Engineering Society, American Ordnance Association and Michigan Sales Executive Club.

Edward L. Lee

. . . at Phillips Corp.

R. B. Osbourne was elected to the newly-created post of vice president, engineering. A veteran of 47 years with the company, Osbourne is well

Now you can get new Hyster

"HYSTAMATIC" DRIVE

fluid torque converter for YC-40 and UC-30 Lift Trucks (4000 and 3000 lbs.)

The most positive "Hairline Inching Control" for stacking, carloading and close-quarter operation.

"Hystamatic" offers the *best control of lift truck power*, makes possible smoother, faster, more effective lift truck operation.

"Hystamatic" incorporates all these latest design advances in fluid converter-type drives:

Automatic Operation speeds forward-reverse shifting—takes full advantage of Hyster fastest lifting speed.

Smoother Operation with finger-tip ease. Sudden shock loads in transmission are cushioned by hydraulic oil in torque converter. Power surges are eliminated.

No Engine Lugging. Torque converter automatically adjusts transmission reduction to driving conditions.

Simplicity of Design makes "Hystamatic" easy to service

Overhead guard is optional equipment.

PLUS...

Hairline Inching Control. Slip for starting and inching is taken through torque converter. Operator can position load in tightest quarters with precision. *"Hystamatic" greatly improves performance in stacking loads where it is necessary to inch and raise the load at the same time.*

Precision Control of Power to Wheels improves traction where traction is critical. Just the *right* amount of power to drive wheels is obtained by control of engine speed with throttle.

Call your Hyster Dealer for full details, or write for Form 1330.

HYSTER COMPANY

2931 N. E. Clackamas Street, Portland 8, Oregon
1031 Myers Street, Danville, Illinois
Hyster N.V., Nijmegen, The Netherlands

Four Factories: Portland, Oregon; Danville, Illinois; Peoria, Illinois; Nijmegen, The Netherlands.

Circle No. 164 on Reader Service Card for more information

You Can Stack ANYTHING on E.M.I. Racks

cut time and handling costs
keep your materials
well stacked!

Equipment Manufacturing storage racks that stack are fabricated of strong, square tubular steel and are adjustable to fit any space or unit load in your plant or warehouse. Special racks designed to your specifications. Field Engineering Service on any installation. Before you decide on a new warehouse, additional storage space or the purchase of stacking equipment, write for our catalog. You save money, space and time with E. M. I. racks.

E.M.I. Pallet Racks are installed at the efficient American Locomotive Company Warehouse in St. Louis, Missouri.

Write for Illustrated Catalog

EQUIPMENT MFG. INC.

21552 HOOVER ROAD • DETROIT 5, MICHIGAN

Materials Handling Equipment — Stacking Racks for Industry

Circle No. 119 on Reader Service Card for more information

MEN IN THE NEWS

Continued

known throughout the coal, steel and general metalworking industries as a pioneer in the design of material handling equipment. **John Graham** was named treasurer by the board of directors to fill the position vacated by the death of **John E. Roth.**

. . . at General Box Co.

Vice president in charge of production, **Emil Holzwart,** has been elected a director, and fills the vacancy created by the death of **James F. Ferguson.** Holzwart joined the company in 1936, and has been in charge of production since 1952. He is vice chairman of the Container Production Conference.

Emil Holzwart

. . . at American Chain & Cable Co. Inc.

Appointment of **Vincent E. Lysaght** as general sales manager was announced by Vice President **Henry Ervin.** An M. I. T. graduate, Lysaght for many years has been recognized as an authority on hardness testing of metals. He authored the book, "Indentation Hardness Testing". Formerly divisional manager of the Helicoid, Campbell Machine and Wilson divisions, he now headquarters in New York City.

V. E. Lysaght

. . . at Coffing Hoist Division

President and co-founder of the 26-year old company, **Frederick W. Coffing,** has retired, and in the future will serve in the

Announcing ...New **Ohio** Shop-Lifter

SELF-CONTAINED, BATTERY-OPERATED MAGNET FOR IN-PLANT USE

Ohio Shop-Lifter Magnet is the newest, latest thing for magnetically handling high-density loads such as large chunks or machined parts. Powered by long-life, self-contained batteries, it can be used indoors because it eliminates the dangers of sudden power failure.

Powerful? Lifts up to 2000 pounds. *Light?* Weighs only 120 pounds; ideal for use on lift trucks or portable shop hoists. *Maintenance?* Batteries last five to 12 average work shifts without recharging. Remote control optional.

Call or write Ohio Electric for information on the new Ohio Shop-Lifter and request Catalog 113.

AA-244

OHIO WELDED MAGNETS. 39 to 65" diameter. Lightweight models in 39 & 45". 6-coil types in 46, 55, 65"; 8-coil in 55 & 65". Weld on top where it can't get dented in. Also capsule coil over 45".

Ohio gives prompt service in rebuilding and reconditioning magnets

OHIO BOLTED MAGNETS. 12 to 65" diameter. 6-coil types in 39 to 65"; 8-coil in 55 & 65". Strap copper coils over 39". Bolts protected in recessed wells. Also capsule coil over 45".

OHIO BASKET MAGNETS. 55 & 65" 4-coil, & 65" 6-coil. For extra heavy-duty service; hefty ears project beyond magnet diameter, ward off damaging blows. No weight carried by bolts. Also capsule coil over 45".

CHESTER BLAND
President

ohio ELECTRIC

THE OHIO ELECTRIC MFG. CO.

5400 Dunham Rd. • Maple Heights • Cleveland, Ohio

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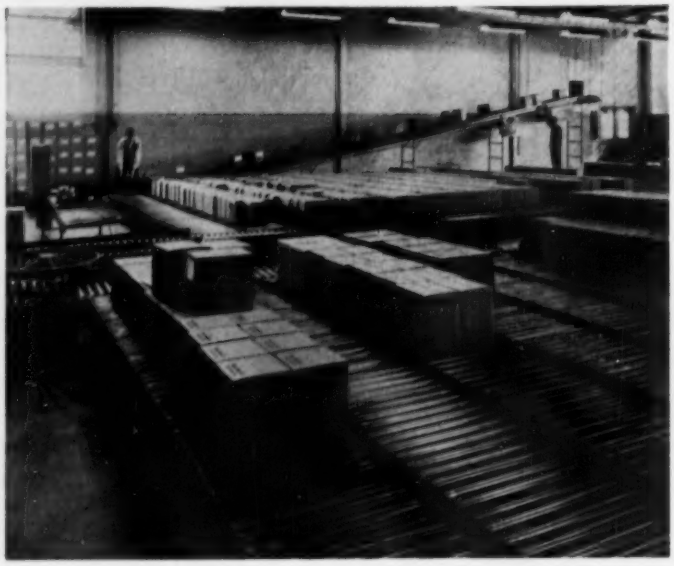
50 years of progress in CONTINUOUS-FLOW CONVEYING



● It was just 50 years ago, in 1905, that the first Mathews Conveyers were designed and built—and applied in a Minnesota warehouse. From that early equipment has evolved some very spectacular continuous-flow conveying systems—indeed, some of the real "show jobs" of the conveying industry.

In these 50 years, Mathews engineers have developed the most complete line of gravity and power conveyers and special conveying machinery to be found anywhere—to serve nearly every class of industry in the United States and Canada.

Whatever is required—standardized conveyer units or a complete system—you'll find that Mathews is your best bet. Three modern plants. Engineering sales offices and standardized conveyer distributors located in most principal cities.

50th Anniversary MATHEWS CONVEYERS 1905-1955

GENERAL OFFICES . . . . ELLWOOD CITY, PENNSYLVANIA
PACIFIC COAST DIV., MATHEWS CONVEYER COMPANY WEST COAST, SAN CARLOS, CALIFORNIA
CANADIAN DIVISION . . MATHEWS CONVEYER COMPANY, LTD. PORT HOPE, ONTARIO

Engineering Offices or Sales Agencies in Principal American and Canadian Cities
Export Representative—Foreign Trade Division of New York Hanseatic Corporation

MATHEWS

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MEN IN THE NEWS

Continued

capacity of a consultant only. **Walter I. Floyd,** president of the parent company, Duff-Norton Company, also becomes Coffing's president. The affairs of the division will be directed by a management committee composed of **J. R. Coffing,** vice president, sales; **J. F. Bookwalter,** vice president, manufacturing; and **George Buck,** secretary-treasurer.

. . . at Mead Board Sales Inc.

Election of **Edward R. Harris** to the vice presidency was announced by **Robert J. Blum,** executive vice president. A graduate of M.I.T., he has been associated with the company in various capacities since 1925. Also announced were the appointments of **Fred G. Robertson** and **James E. Calvin** as assistant vice presidents.

E. R. Harris

. . . at Heppenstall Co.

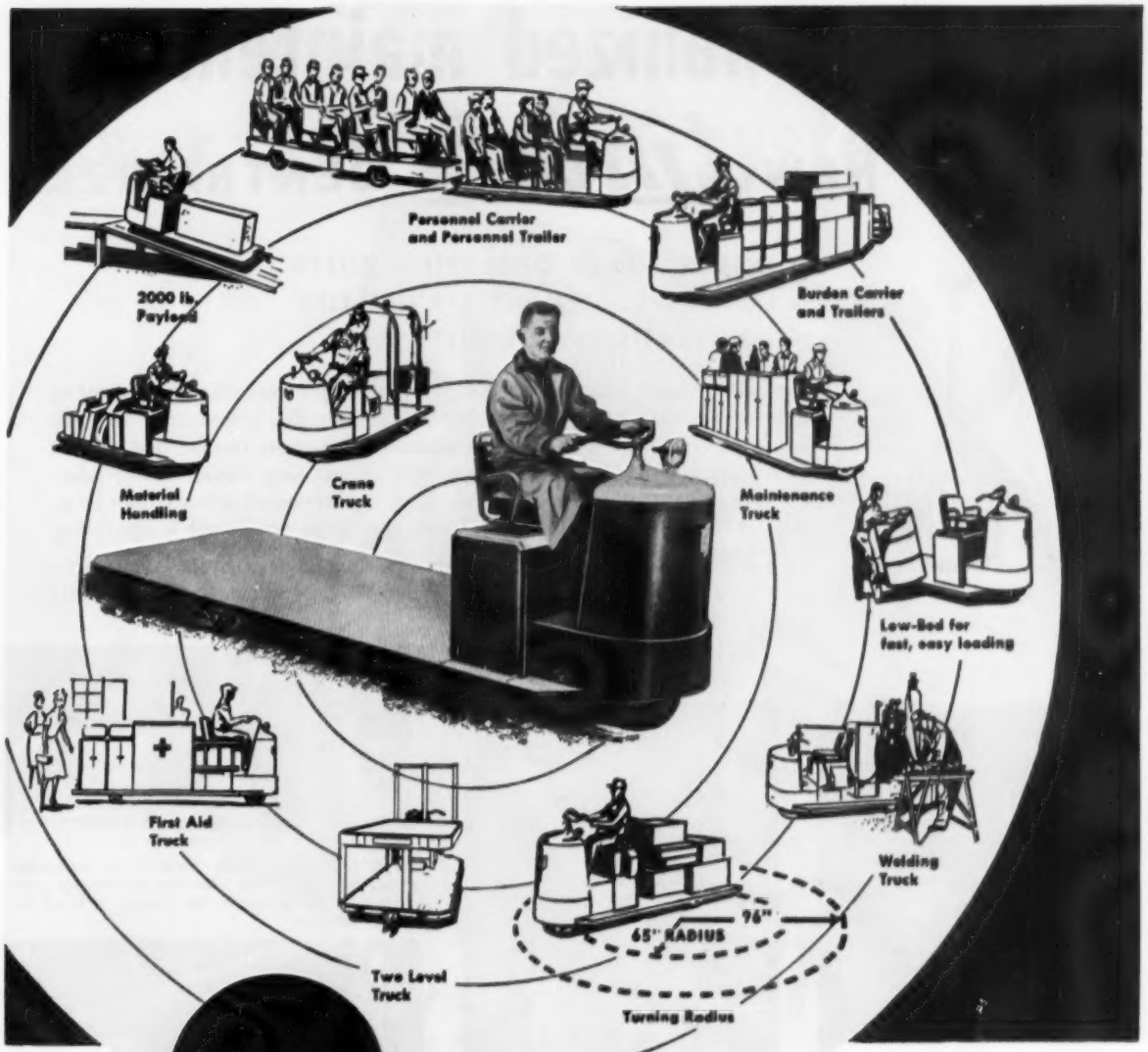
Two veteran employees have been elected to vice presidencies. They are **Irvin E. Walton** and **Howard G. Grim.** Walton will head up purchases and traffic and Grim will manage manufacturing operations.

. . . at Gaylord Container Corp.

The board of directors recently approved the following corporate officers: **William L. Meyer,** vice president and treasurer; **Clair S. Cullenbine,** secretary; and **Victor C. Eggerding,** assistant treasurer.

. . . at G. H. Tennant Co.

Vice President **Orville C. Hognander** has been elected to the board of directors. Associated with Tennant for the past



This VERSATILE New Electric

is cutting costs on dozens of expediting jobs!

For moving men and materials—smoothly and efficiently—this great new Low-Bed Electric has proved its superior versatility—power—maneuverability—durability—and economy.

Pictured here are some of the successful jobs being handled by this rugged, reliable workhorse. **As a burden carrier or as a specialized expediter, the new Kalamazoo will deliver maximum tonnage—at absolute minimum cost per pound of payload.**

- **Drive**—bevel gear and chain reduction, Timken roller bearings.
- **Motor**—24-volt or 32-volt series-wound—reversible—sealed lubricated ball bearings.
- **Controls**—Square D finger tip control—four speeds forward and four speeds reverse.
- **Frame**—all steel, welded into one rigid unit—stake pockets.
- **Brake**—hydraulic type—operated by foot pedal in addition to safety seat.

Gas Speed Trucks

Kal-Truks

Xpediters

KALAMAZOO
MANUFACTURING COMPANY
1827 Reed St. Kalamazoo, Mich., U.S.A.

FOR OVER 71 YEARS SERVING INDUSTRY AND RAILROADS ALL OVER THE WORLD

Circle No. 176 on Reader Service Card for more information

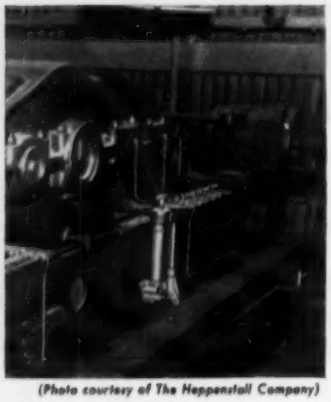
Now..."mechanized maintenance"

WITH NEW *Lincoln* CENTRALIZED

- INSURE LOWER OPERATING COSTS
- LONGER EQUIPMENT SERVICE-LIFE
- APPLICATIONS UNLIMITED

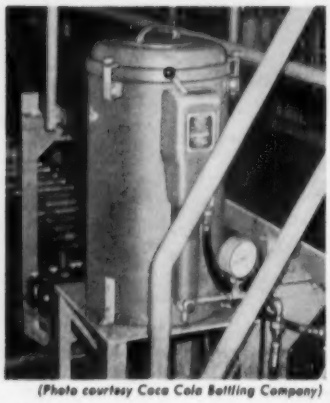
Modern, efficient materials handling can no longer tolerate the high cost of old-time oil can, grease gun lubrication methods. Equipment down-time for lubrication, premature bearing replacements, needless repairs and wasted man-hours can be completely eliminated by installing Lincoln Power Lubrication Systems which automatically assure application of refinery pure lubricant in measured quantities to all bearings while equipment is operating.

Now is the time to investigate these remarkable low cost Systems and learn how easy it is to slash operating costs on existing facilities, or add multiple sales features to your product.



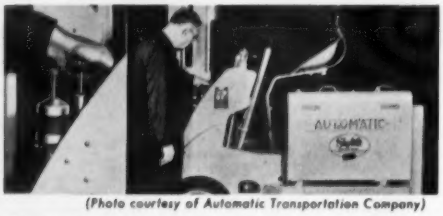
(Photo courtesy of The Heppenstall Company)

OVERHEAD CRANES—15 bearings on the bridge and 22 on trolley are lubricated in just 10 seconds by five strokes of the central pump.



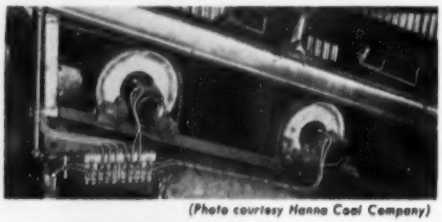
(Photo courtesy Coca Cola Bottling Company)

CASE CONVEYORS—power-operated, semi-automatically controlled pump supplies pre-measured applications of lubricant in seconds to all bearings.



(Photo courtesy of Automatic Transportation Company)

FORK TRUCKS—a single stroke of the Multi-Luber pump handle by driver lubricates all bearings while truck is operating. System has reservoir sufficient for 120 grease jobs.



(Photo courtesy Hanna Coal Company)

COAL CONVEYORS—all bearings are automatically lubricated from centrally located time clock controlled, air-motor operated pump. Time interval can be set as desired.

You Profit 8 Ways...

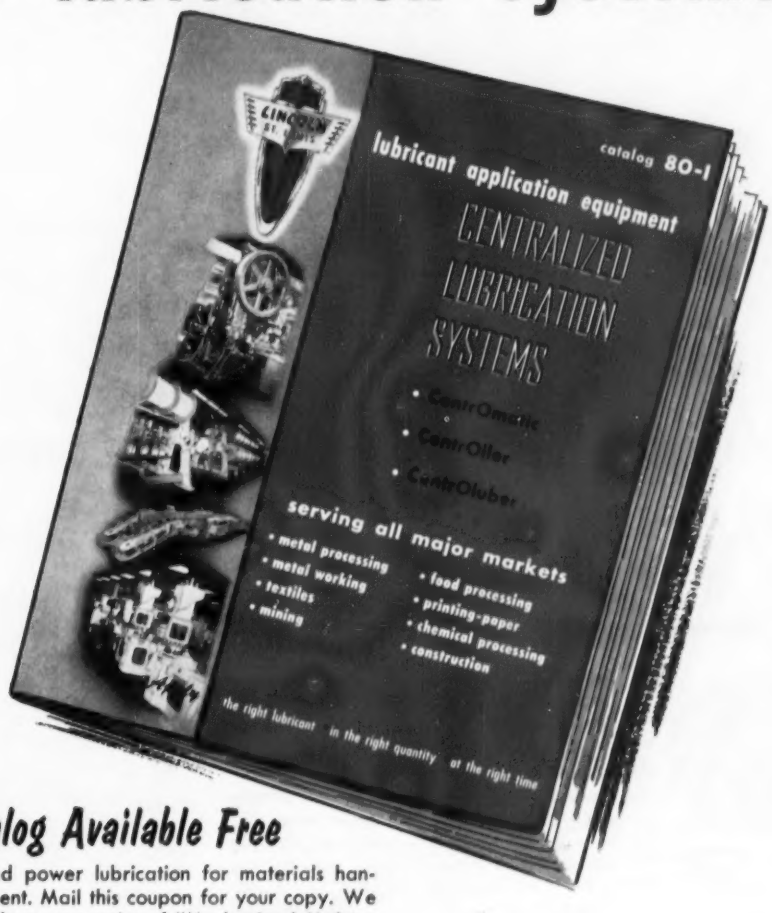
1. Eliminates equipment down-time for lubrication.
2. Reduces man-hours for lubrication to a bare minimum.
3. Cuts lubricant consumption up to 50%... eliminates application of contaminated lubricant.
4. Increases productive rate and efficiency of equipment to a uniform maximum.
5. Eliminates equipment down-time for repairs due to bearing failure or faulty operation of worn parts resulting from inadequate lubrication.
6. Reduces power consumption up to 30% by reducing friction... maintains power used consistent with work done.
7. Eliminates product spoilage and fire hazards from dripping of excess lubricant.
8. Eliminates personal injuries and corresponding compensation costs attributable to hand methods of lubrication.

Lincoln THE MOST TRUSTWORTHY NAME IN LUBRICATING EQUIPMENT

Circle No. 185 on Reader Service Card for more information

FOR MATERIALS HANDLING EQUIPMENT

power lubrication systems . . .



New Catalog Available Free

on centralized power lubrication for materials handling equipment. Mail this coupon for your copy. We will also send you a reprint of "Mechanized Maintenance of Handling Equipment" as it appeared recently in FLOW magazine, describing the accelerated trend to Automated Lubrication.

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LINCOLN ENGINEERING COMPANY

5766 Natural Bridge Avenue • St. Louis 20, Missouri

To LINCOLN ENGINEERING COMPANY
5766 Natural Bridge Avenue, St. Louis 20, Missouri

Please send me:

- ☐ materials handling equipment lubrication catalog 80-1
- ☐ "Mechanized Maintenance . . ." reprint
- ☐ please have your engineer call

Name ..... *Title* .....

Company .....

Address .....

City ..... *State* .....

HERE'S A BETTER WAY TO...
CONVEY LIGHT PRODUCTS!
Freshly packaged cheese sections emerge from automatic packaging machine and are conveyed smoothly and quickly to labelling machine—products received no handling—remain fresh and clean.

WITH **WENDWAY**

Wendway is ideal for conveying fresh-unwrapped meat. Stainless steel belting is recommended.

Cartons or packages ride perfectly on Wendway's smooth, silent belting.

Wendway is the most versatile conveyor in industry today. With Wendway, you can eliminate the multiple handling of products, save man hours and floor space. You can have remote-controlled efficiency in conveying any light products to any point in your plant. Wendway turns corners, goes up-down in single or multiple tiers—and Wendway's steel wire belting is ideal for handling *anything* up to approximately twenty pounds per package.

Then too—Wendway does not sag or accumulate oils or dirt like *ordinary* belting. It can be kept highly sanitary—easily.

But best of all—Wendway will pay for itself in actual savings.

If you have a light package conveying problem—why not use the coupon below or write today for full details on this versatile conveying system.

Gentlemen:
Please send me additional information about Wendway for conveying_____.
Name_____
Company_____
Address_____ Zone____ State_____
Have a USP Conveyor Engineer contact me at once ☐

UNION STEEL PRODUCTS COMPANY
ALBION, MICHIGAN

Circle No. 283 on Reader Service Card for more information

MEN IN THE NEWS

Continued

19 years, he directs all marketing activities of the company, and has been active in encouraging improved sales techniques nationally. He is vice chairman of the board of National Sales Executives.

. . . at Electric Storage Battery Co.

William C. Leingang, former assistant general manager, has been named assistant to the president. A veteran of 32 years' experience with Exide, Leingang is a native of Sandusky, Ohio and a graduate of the University of Michigan. He is a member of the American Institute of Management, Society for Advancement of Management, and Society of Automotive Engineers. Midwestern industrial sales manager **Herbert F. Sauer** recently completed half a century of service with the company. In observance of the occasion, he was honored at a testimonial dinner in Chicago, which was attended by Vice President **Roland Whitehurst** and a number of associates well known in the industry.

W. C. Leingang

. . . at Chrysler Corp.

Former works manager of the Marine and Industrial Engine Division, **William A. Martin,** has been elected vice president and general manager of the division. Martin joined the firm in 1942 and has served in various capacities since that time.

. . . at Stephens-Adamson Mfg. Co.

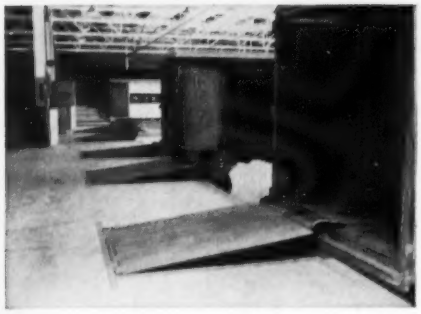
The board of directors has elected **A. D. Sinden** vice president and appointed **D. W. Parkin** chief engineer. Other action

FLOW
Circle No. 289 on Reader Service Card

BREAK UP TRAFFIC JAMS AT YOUR LOADING DOCKS

SPEED LOADING . . . INCREASE SHIPMENTS . . . PREVENT ACCIDENTS

WAYNE *Production-Booster* DOCK LEVELERS



If finished products or raw materials are piling up at your loading docks it is time to streamline your materials handling with Wayne Dock Levelers.

SPEED LOADING and UNLOADING—Wayne Dock Levelers tilt to any truck bed height. Compensate for any change in height of truck as it is being loaded or unloaded. Speed loading by as much as 75%.

INCREASE VOLUME PER MAN HOUR—Wayne Dock Levelers with push-button controls, can be easily operated by one man. No manual labor necessary in lifting or sliding plates.

ELIMINATE HANDLING and RELOADING—Wayne Dock Levelers allow material on industrial trucks to be transported directly from shipping department to waiting highway truck. No need to unload and reload.

PREVENT ACCIDENTS—Wayne Dock Levelers assure safe, positive ramp connections between shipping platform and highway truck. Ramp adjusts to exact height, throwover plates bridge gap . . . leveling fingers assure positive contact.

Wayne Dock Leveler is hydraulically operated, powered by air compressor or electric power-pack unit. Speed up your materials handling . . . get the facts on LIFTronics—Wayne's scientific materials handling system.

See Wayne Lifts in action—Materials Handling Show—Booth No. 1976

THE WAYNE PUMP COMPANY
Industrial Division • FORT WAYNE, INDIANA
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GET THIS NEW BOOK ON HOW TO SPEED LOADING AT YOUR PLANT

AIR COMPRESSORS

HOSE REELS

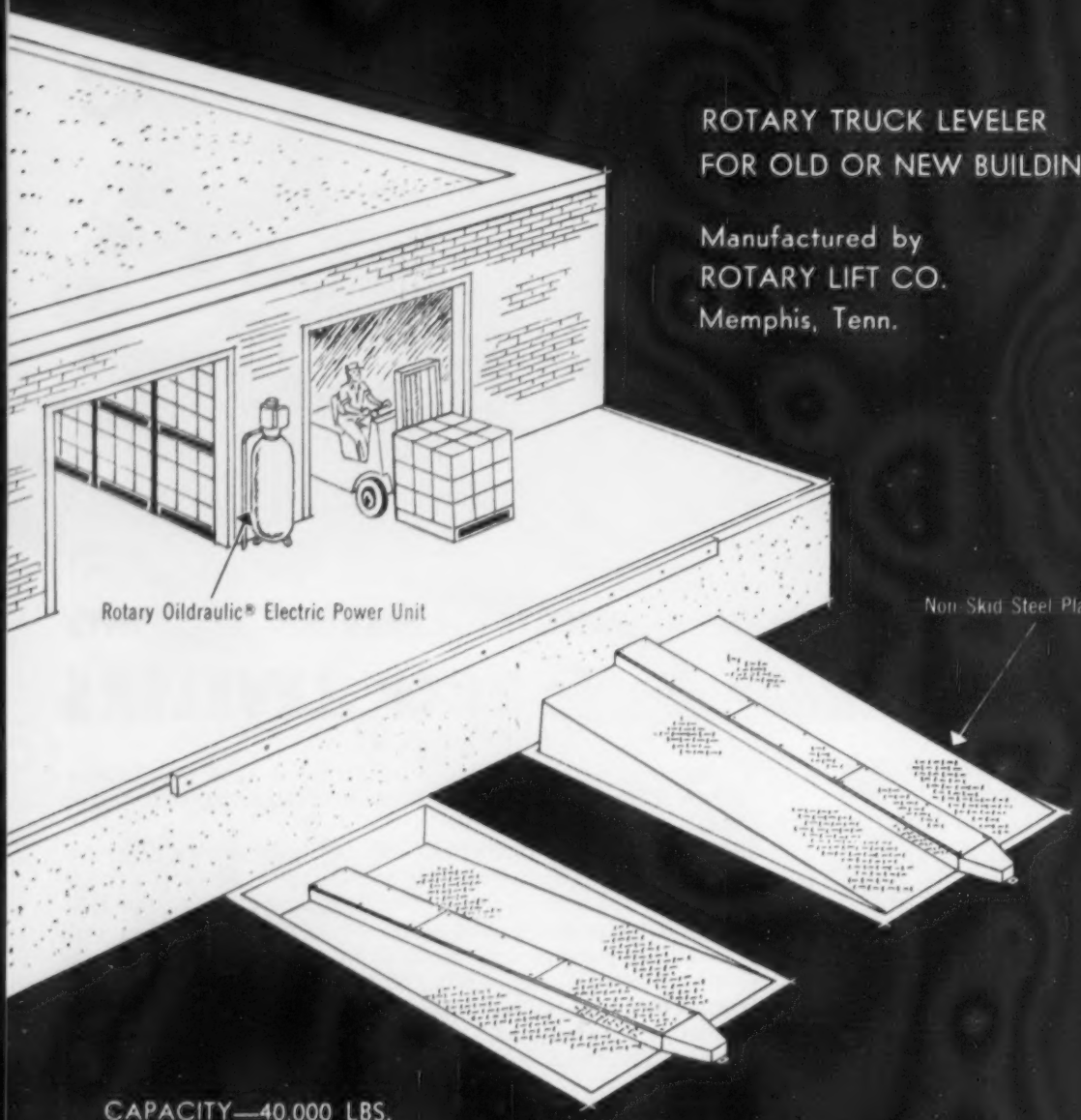
LUBRICANT DISPENSERS

INDUSTRIAL PUMPS

INVADER PUMPS

ROTARY TRUCK LEVELER
FOR OLD OR NEW BUILDINGS

Manufactured by
ROTARY LIFT CO.
Memphis, Tenn.



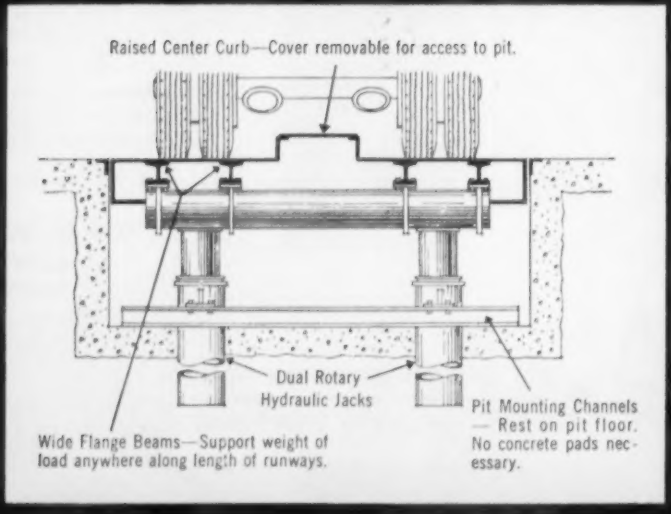
CAPACITY—40,000 LBS.

PLATFORM SIZE—10' x 14'

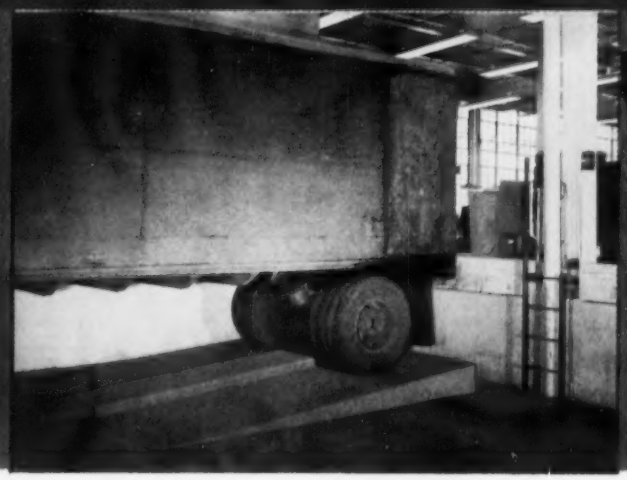
TRAVEL—24" (Divided to conform to loading dock height)

CONTROL—Remote push button or palm button at power unit

OPERATION—Oil-hydraulic with electric power unit


Raised Center Curb—Cover removable for access to pit.
Dual Rotary Hydraulic Jacks
Pit Mounting Channels — Rest on pit floor. No concrete pads necessary.
Wide Flange Beams—Support weight of load anywhere along length of runways.

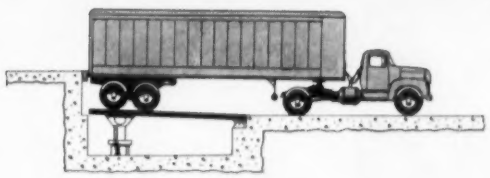
Now you can make big savings in loading costs and dock space

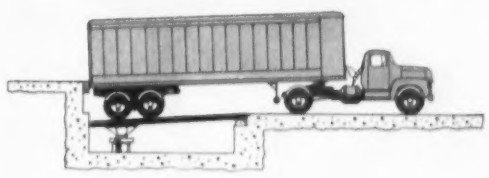


New

ROTARY TRUCK LEVELER

Raises or lowers trailer to dock level for fastest loading and unloading





The Rotary Truck Leveler is a hydraulically-operated device that raises or lowers the entire rear section of any highway carrier to bring the bed on a level with the loading dock platform.

Takes no space. It eliminates the need for ramps. No space is required for the Rotary Truck Leveler because it is set into the driveway surface in front of the loading dock. The dock platform is completely free of obstructions which restrict traffic flow.

The angle of incline between bed and platform is reduced to a minimum so that materials handling equipment moves in and out with speed and safety. The problem of low-underclearance factory trucks "hanging up" on sharply inclined ramps is eliminated.

For old or new buildings. For existing buildings, the Rotary Truck Leveler provides maximum speed and efficiency without expensive dock alterations. Dock construction or space limitations which prevent use of ramps do not affect installation of the Rotary Truck Leveler. It can be used at any loading dock.

In new construction the Rotary Truck Leveler saves the 96 sq. ft. or more of building area required for each ramp. The Rotary Truck Leveler will never be made obsolete by changes in materials handling systems or equipment used at the loading dock.

Faster truck spotting. The raised center curb section of the Rotary Truck Leveler assures fast, accurate truck positioning. Operation is by economical, maintenance-free Rotary Oildraulic® Electric power unit. Dependability assured by Rotary Lift Company's experience in building over 100,000 hydraulic lifting devices. Mail coupon for more information.

Rotary **Truck Leveler**

Manufactured by
ROTARY LIFT CO., MEMPHIS 2, TENN.

Specialists in oil-hydraulic lifting devices.

MAIL COUPON FOR COMPLETE DATA

Rotary Lift Co.
1042 Kentucky
Memphis 2, Tenn.

Send complete data on the Rotary Truck Leveler to:

Name_____

Address_____

City_____ State_____

EEZION ROAD TRAILER ELIMINATES LOAD-LIFT

•

WHEEL YOUR LOAD STRAIGHT ONTO THE EEZION AT FLOOR LEVEL

Then operate the hydraulic pump—hand or power—to raise the load platform—

The trailer is now ready for the highway. 13½" ground clearance—over run braking servo: or pressure brakes on larger models.

•

No load on hydraulic system with platform raised.

•

Capacities: 15 cwt, 30 cwt, 3 tons, 5 tons. Special models for carrying cable drums—larger capacities to order.

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Head Office:
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Pulitzer Inc., 40 West 29th St., New York, N. Y.
Telephone: Murray Hill 5-9223 • Cables: Pulitzer, N. Y.

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MEN IN THE NEWS

Continued

included the naming of **J. R. Streit** as regional sales manager, **H. S. McIntosh** as assistant plant manager, and **E. O. Weise** as assistant chief engineer. All other officers of the company were re-elected.

. . . at Wisconsin Motor Corp.

A number of advancements were made known by President **H. A. Todd. Phil Norton** was named executive vice president; **F. B. Esty** is now chief engineer; **Ralph Switzer** was appointed director of research and development engineering; and **Miss Ann M. Crantz** has become assistant secretary.

. . . at Robert Gair Co., Inc.

Norman F. Greenway, senior vice president in charge of the folding carton division, was elected to the board of directors. He joined the firm in 1934 and has served as a vice president since 1939.

. . . at Ainsworth Manufacturing Corp.

Manager of the Mult-A-Frame Division is **Russell H. Randolph.** Formerly sales manager of the division, he will continue to direct the division's sales activities, in addition to his managerial duties.

. . . at Minnesota Mining & Mfg. Co.

Executive vice president and director **Louis F. Weyand,** who is completing 40 years of service with the company, has been named director of sales. He succeeds **George H. Halpin,** also an executive vice president and board member. Halpin will remain active as a consultant in specific sales and operating problems.

FLOW

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USE THIS TICKET TO SEE THE GREATEST NATIONAL MATERIALS HANDLING EXPOSITION IN HISTORY!

International Amphitheatre, Chicago
May 16 to 20, 1955

SEE NEW DEVELOPMENTS IN MATERIALS HANDLING THAT MAKE PRESENT MACHINES AND METHODS OBSOLETE—EXHIBITED BY THE INDUSTRY'S PACEMAKING, PROGRESSIVE MANUFACTURERS.

Tear out ticket along the dotted line. Properly filled in, it will admit you to the 6th National Materials Handling Exposition. No other registration is required. For additional tickets, write to the Exposition Management, Clapp & Poliak, Inc., 341 Madison Avenue, New York 17, N. Y. There is no charge or obligation.

(OVER)

THE EXPOSITION MANAGEMENT
invites you to attend the

6th National Materials Handling Exposition

Hundreds of exhibits . . . brand new products, methods, and ideas . . . shown by the pace-setting companies who believe that *the technology of materials handling never stands still* • See the latest developments in machines, equipment, supplies and services that will keep your plant up to date . . . save money and time. The only exposition that covers the whole range of materials handling problems • All in one place, at one time.

International Amphitheatre, Chicago, May 16-20, 1955

RAPID REGISTRATION

This invitation is your rapid registration card and badge. It is intended to speed your entry into the show, to avoid your waiting in line. DO NOT MAIL. See instructions reverse side.

SHOW HOURS

10:00 A.M. TO 5:30 P.M. DAILY
MONDAY THROUGH FRIDAY

CHILDREN NOT ADMITTED

FIGHT MATERIALS HANDLING OBSOLESCENCE IN YOUR PLANT!

It's been a long two years since you've had this great opportunity to see the latest developments in materials handling equipment, machines, supplies, services and methods.

Inadequate materials handling methods and equipment may be draining your profits; diverting essential skilled labor; bottlenecking your production; making your storage inefficient; slowing down shipments; killing your investment in automatic production machinery.

Right now is the time to:

SEE hundreds of exhibits by the pacemaking, progressive companies who are making newly designed materials handling equipment to reduce your handling costs, and speed your production.

TALK to thousands of technical experts who will tell you how their equipment has been developed to meet the needs of modern automated production machines.

COMPARE the actual performance of all the makes of materials handling equipment you are interested in. You'll see them side-by-side.

6th National Materials Handling Exposition

International Amphitheatre, Chicago, May 16 to 20, 1955

Tear out ticket along the dotted line. Properly filled in, it will admit you to the 6th National Materials Handling Exposition. No other registration is required. For additional tickets, write to the Exposition Management, Clapp & Poliak, Inc., 341 Madison Avenue, New York 17, N. Y. There is no charge or obligation.

6th National Materials Handling Exposition

NAME _____

TITLE _____

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RAPID REGISTRATION

Fill in card and stub COMPLETELY. Use TYPEWRITER only. Handwritten or incomplete cards subject to delay. DO NOT MAIL CARD. Bring it to Rapid Regisfration Desk at the Exposition.

YOUR NAME _____

TITLE _____

COMPANY NAME _____

CO. ADDRESS (STREET) _____

CITY _____ ZONE ____ STATE _____

COMPANY'S BUSINESS OR PRODUCT _____

YOUR HOTEL _____

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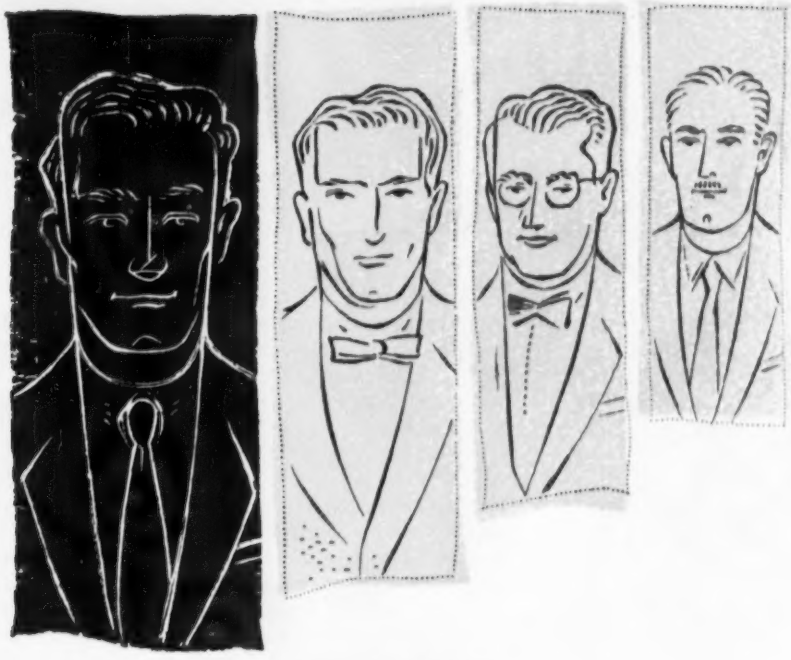

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because you qualify!

Do *you* know why you get this magazine without charge? How can the publisher *afford* to send you this leading national magazine every month—without cost to you? Here's why . . .

Advertisers insist on Quality Readership

It's that simple!

Your local material handling equipment distributor *pays us* for your subscription to FLOW because he knows you are an important material handling equipment user; because he knows you are responsible for specifying and/or buying material handling equipment. Naturally, he is only willing to spend this kind of money on his best and most important customers.

This type of circulation is called Franchise Circulation

FLOW readers are *hand-picked*. They are important people in the material handling field—they are carefully chosen because of their interest in new and better material handling products, equipment and techniques.

That's why—FLOW spends considerable time, money and effort on every issue to make it worthwhile reading—realistically helpful, intelligently interesting and useful to our *important readers.*

FRANCHISE CIRCULATION

FLOW MAGAZINE

1240 ONTARIO STREET • CLEVELAND 13, OHIO

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NEWS VIEWS TRENDS

CONVEYOR GROUP CONFERS IN CAPITOL

An industry conference with executives of the Department of Commerce was held by conveyor equipment manufacturers, April 5 in Washington, D. C. Subjects covered included export-import problems and suggested solutions; tax matters present and proposed; and controls.

FCC GIVES TRUCKERS 20 FREQUENCIES

For the first time, the nation's motor carriers are now permitted intra-city radio operation on exclusive frequencies, according to C. M. Lewis, manager, Communications Equipment Marketing, Radio Corporation of America. The new service will enable long-haul trucking firms to benefit from the economies of two-way radio control of shipments since they can now operate their own radio channels within city limits for communication between city-based terminals and direction of over-the-road rolling stock, he said. RCA assisted the American Trucking Association in its bid for the 20 radio frequencies established by the Federal Commission for use by trucking firms.

AMERICAN HOIST ACQUIRES LAUGHLIN

Acquisition of the Thomas Laughlin Company by American Hoist & Derrick Company was announced by John E. Carroll, president of American Hoist. The merger was formally approved at a special meeting of stockholders of the two companies. Donald S. Laughlin and Andrew W. Peat, former president and treasurer, respectively, of the Laughlin Company, were elected to the American Hoist board of directors. All employees of the Portland, Maine plant will be retained, and the company will be operated as the Thomas Laughlin Division.

SIMPLICITY IN CANADA

A new Canadian subsidiary has been formed by Simplicity Engineering Company. Known as Simplicity Materials Handling Limited, the company will be located at Guelph, Ontario. E. L. A. Whitaker, formerly industrial commissioner for the City of Guelph, will manage the Canadian company.

PLASTICS SHOW RESCHEDULED

The World Plastics Fair and Trade Exposition will be held October 5-9 at the National Guard Armory in Los Angeles. Originally scheduled for April 6-10, major reason for the change was to allow exhibitors more time in which to prepare for the show, according to Philip M. Kent, exposition director.

BORG-WARNER BUYS BROOKS EQPT. CO.

Acquisition of Brooks Equipment and Manufacturing Co. by the Ingersoll Kalamazoo (Mich.) Division of Borg-Warner Corp. was recently made known. J. H. Ingersoll is president and R. F. Schultz is vice president of the new subsidiary which is located in Knoxville, Tennessee. An expansion of the Brooks operation is expected, according to Ingersoll.

WOW!

This Electric Truck is about $1200 a year cheaper than Gas!

It's a fact —and user reports prove it—Lewis-Shepard Master Electrics save you hundreds, even thousands of dollars a year.

While the figures shown are average, it's obvious that if your application is suitable to either an electric or gas truck, you'll really save with a quality-built Lewis-Shepard Master Electric.

Just look at the Model "J" advantages:

- Lubricated for life — never needs greasing — this feature alone saves many hours of maintenance.
- Safe travel speeds for indoor operation, 3 speeds forward and reverse.
- Minimum aisle requirements — tightest turning counter-balanced fork lift on the market.
- Foot controlled traction, brake, lift, lower, and tilt — leaves both hands free to maneuver.
- A quarter a day runs the "J" — compare this with the $1.36 average 8-hour cost for running a gas truck.

And remember, you can obtain the Model "J" on any of Lewis-Shepard's 6 procurement plans . . . your "out-of-pocket" costs need not be higher to get the depreciation, maintenance, and power savings indicated above.

Why not write for all the facts. Use the coupon for convenience.

ANNUAL COST COMPARISON*

(2504 operating hours)

LEWIS-SHEPARD ELECTRIC Model J — 2000 lb. cap. @ 48" load length with 130 inch telescopic mast.		GAS TRUCK 2000 lb. cap. @ 48" load length with 130 inch telescopic mast.
$480	DEPRECIATION	$750
290	MAINTENANCE LABOR AND REPAIR PARTS	920
75	POWER OR FUEL	425
$845	TOTAL	$2,095

*average figures taken from user reports

MULTIPLY MANPOWER LEWIS-SHEPARD

LEWIS-SHEPARD

135 Walnut St., Watertown 72, Mass.

The Master Line

Please send me

- ☐ L-S SpaceMaster Model "J" Catalog No. 33
- ☐ Gas vs. Model "J" Truck Cost Comparisons

Name _____

Company _____

Address _____

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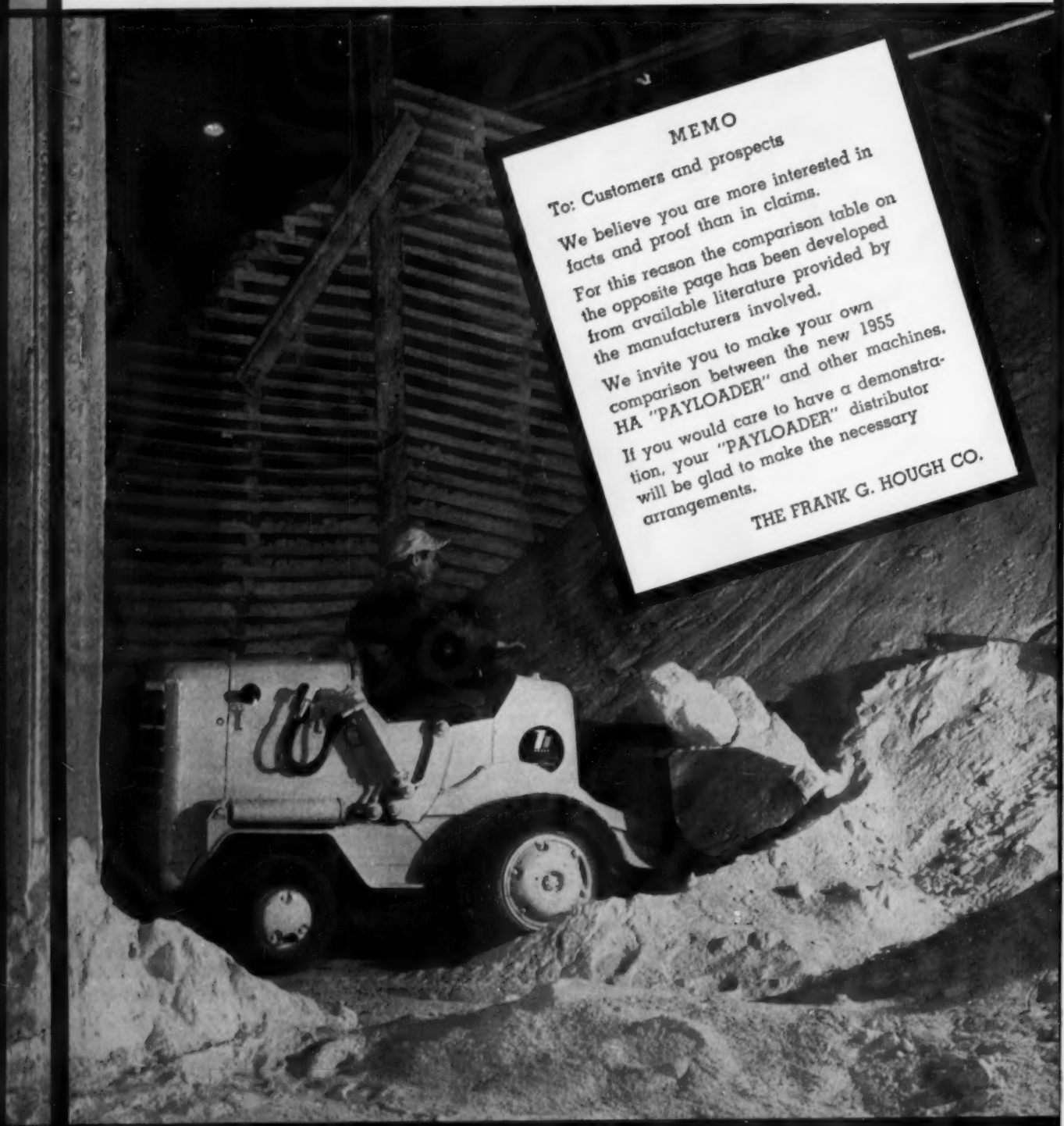
A Completely New and Different PAYLOADER®


MEMO
To: Customers and prospects
We believe you are more interested in facts and proof than in claims.
For this reason the comparison table on the opposite page has been developed from available literature provided by the manufacturers involved.
We invite you to make your own comparison between the new 1955 HA "PAYLOADER" and other machines.
If you would care to have a demonstration, your "PAYLOADER" distributor will be glad to make the necessary arrangements.
THE FRANK G. HOUGH CO.

See it at the National Material Handling Exposition – Chicago, May 16-20, Booths 1608-10

...years ahead in design, construction and performance!

the NEW model HA

Thirty four years of pioneering experien
the manufacturer who has produc
tractor-shovel units
more th

	1955 HA model	Machine A	Machine B	Machine C	Machine D	Machine E	Machine F
HEAPED CAPACITY CU. FT.	18	X	X	X	X	X	X
STRUCK CAPACITY CU. FT.	14	12	12	12	12	13.5	11
LIFT CAPACITY O MPH LBS.	3000	1000	1200	1250	1500	3000	1200
BREAKOUT FORCE LBS.	3100	X	X	X	X	X	X
ANGLE BREAKOUT GROUND LEVEL °	40°	NONE	NONE	NONE	NONE	22°	NONE
MAX. DUMPING HEIGHT FT. IN.	5'-2½"	4'-3"	4'-6"	6'-2½"	5'-4"	4'-5"	5'-0"
TURNING RADIUS OUTSIDE CORNER BUCKET FT. IN.	6'-3½"	6'-11"	6'-6"	5'-1"	7'-6"	6'-6"	5'-11½"
TURNING RADIUS OUTSIDE REAR HUB FT. IN.	6'-2"	6'-8"	X	6'-8"	X	6'-4"	X
TORQUE CONVERTER	YES	EXTRA	NO	NO	NO	YES	NO
AVERAGE WEIGHT LBS.	4980	5000	4875	5250	6000	6000	4400
GAS-POWERED MODEL	YES	YES	YES	YES	YES	YES	YES
DIESEL-POWERED MODEL	YES	YES	NO	NO	NO	NO	NO

X — indicates NOT KNOWN

The 1955 HA PAYLOADER has more productive capacity than any other unit in this size range!

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18 cu

dumping
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dumping
LOADER

turning rad
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with no incr
base.

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... parking brake and many
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THE FRANK G. HOUGH CO.

PAYLOADER®

MANUFACTURED BY
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Send me full information on the new Model HA

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Title.....

Company.....

Street.....

City..... State.....

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Continued

ROBERT GAIR CO. EXPANDS IN SOUTH

A large-scale expansion program in the South has been undertaken by Robert Gair Company, Inc. Directors of the company have approved, for submission to stockholders, agreements under which the company will acquire the assets and assume the liabilities of Southern Advance Bag & Paper Company, Inc., Hodge, Louisiana, and Great Southern Box Company, Inc. of New Orleans, and Jackson and Magnolia, Mississippi. Both agreements provide in effect for an exchange of Gair stock for the shares of the companies it will acquire. The expansion, according to George E. Dyke, Gair president, will extend the company's fabricating activities into the kraft bag field, in which it is not presently engaged; extend its container operations to a rapidly growing section of the Deep South which it does not currently serve; and substantially increases its timberland holdings and production of woodpulp and kraft.

MILLION DOLLAR DISPLAY

Harnischfeger Corporation recently treated nearly 1000 visitors to a million dollar display of new P&H equipment. Occasion for the show was the company's annual sales conference and open house. Assembled in the giant display were numerous models of power crane and shovels, truck cranes and crawlers, plus welding equipment, diesel engines, hoists and soil stabilizers. At the height of the show, pictures were made and the entire display was later seen on television in the Milwaukee area.

SANDVIK BUILDS MODERN PLANT

Sandvik Steel, Inc. will consolidate its four divisions in an 85,000 square foot building now under construction in Fair Lawn, New Jersey. The modern one-story unit, including a two-story office section, is located on a 10-¼ acre plot, and allows for future expansion. The plant will be ready for occupancy at an early date, according to President Carl Hildebrand.

NAVY PURCHASING MOVING WEST

The Navy Purchasing Office, which buys all material handling equipment for the Armed Forces, is scheduled to move to Port Hueneme, California on July 1, according to an order issued by Admiral Arnold. It is understood that all technical and development work will be continued at the present headquarters in Washington, D. C.

MINE CONVEYOR TWO MILES LONG

Two miles of conveyor belting and machinery components will be supplied by Hewitt-Robins, Inc. for the new San Manuel Copper Company Mine in Tiger, Arizona. It will be the third largest copper mine in the United States when it goes into operation in 1956. The conveyors will carry copper ore from the storage area outside the mine through the mill where it is processed.

CLARK PURCHASES PLANT PROPERTY

Purchase of plant buildings immediately adjacent to its Battle Creek, Michigan plant, was made known by Clark Equipment Company. Part of the newly acquired 224,000 square foot plant will be used for storage of finished products and the remainder will be used for standby purposes. According to Clark, there are no immediate plans for setting up manufacturing operations on the 16-acre tract.

New COLSON "HANDLER"

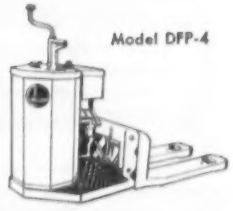
handles double-faced pallet loads up to 4000 pounds

Even in busy, narrow aisles the COLSON "Handler" is easy to maneuver. It turns in its own length—weighs (and costs) about ½ as much as a fork truck and lifts and carries loads up to 4000 pounds. Just one lever does all the work—shifts, lifts and brakes. Rider has unimpaired visibility at all times—forward or backwards.

6 H.P. *gas* engine provides plenty of power for rugged round-the-clock operation—with no time out for recharging which is necessary with battery-powered trucks.

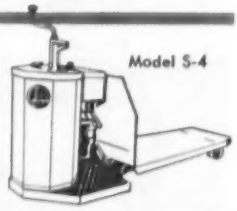
Before you buy a more expensive piece of equipment, make sure that the COLSON "Handler" won't do the job as well or better—at a fraction of the cost.

Model DFP-4



DOUBLE-FACED PALLET "HANDLER"
$1695
F. O. B. ELYRIA, OHIO

Model S-4



PLATFORM TYPE "HANDLER"
$1395
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Write us direct or consult the yellow pages of your phone book—(under "Trucks—Industrial") for the COLSON office near you.

Descriptive bulletin—The COLSON Handler—free on request.

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HYDRAULIC, ELECTRIC AND MECHANICAL POWER LIFTS AND TRANSPORTS

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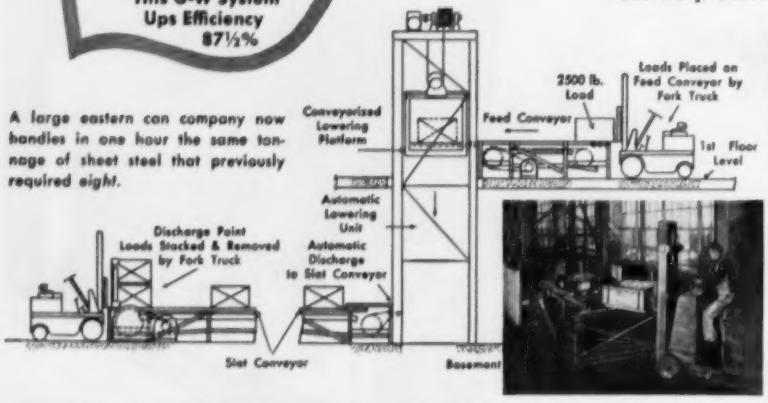
"Inter-Floor Handling? ... ... check Gifford-Wood"

That's right... no need to let your plant operations bog down because of knotty inter-floor handling problems. Over the years, G-W engineers have successfully met the varied requirements for handling many different items in dozens of different industries. And while G-W doesn't have the answer to your problem, per se, they have what is more important —the background of proven accomplishment. Here's proof...

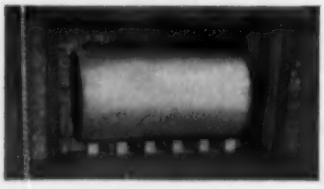
This G-W System Ups Efficiency 87½%

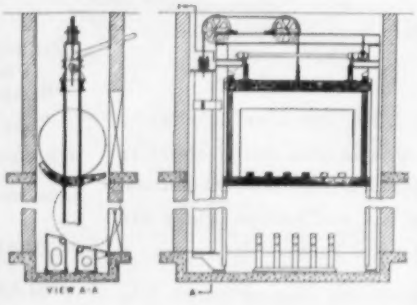
A large eastern can company now handles in one hour the same tonnage of sheet steel that previously required eight.



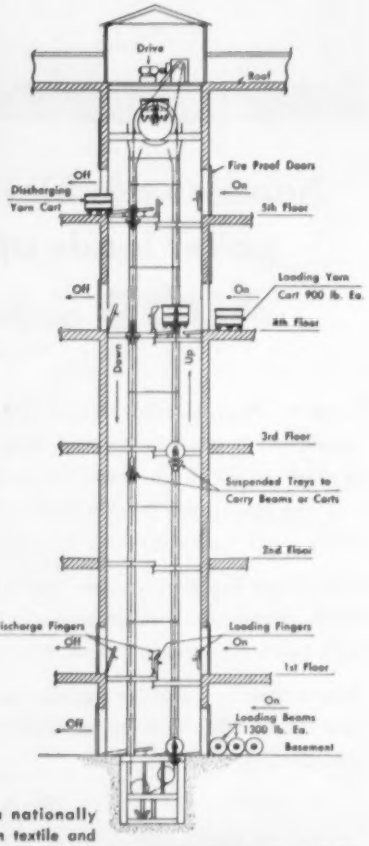
This G-W System Saves Costly Plant Space in Metropolitan New York

A big New York daily newspaper saves valuable space, handles ¾ T. newsprint rolls faster, easier, more safely with this G-W Pneumatic Drop.

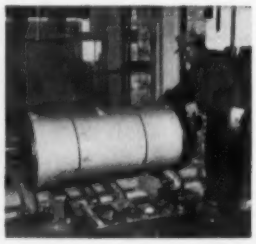




This G-W System Saves $25,000.00 Annually



For a nationally known textile and rubber company this system handles heavy rayon beams and box trucks safely, with less muscle work, through six stories, automatically loading and discharging.



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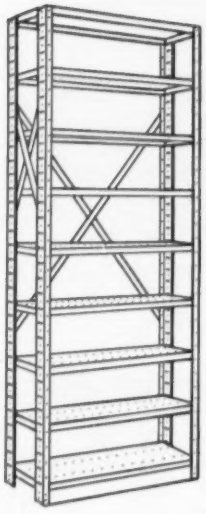
Like putting money in the bank!

Your savings in Borroughs Steel Shelving start with its installation. No shelving is easier and quicker to assemble. No shelving is more practical and more flexible. Borroughs engineered features make it the best steel shelving investment on the market today. Don't gamble . . investigate Borroughs before you buy.

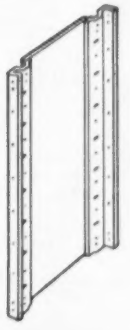


BORROUGHS

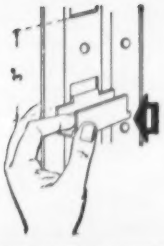
*UNITIZED *flexi*

STEEL SHELVING

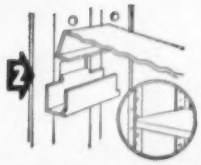
***Every unit is a unit within itself**



Borroughs 1-piece closed uprights for closed shelving . . no bolting . . only 1 piece to handle . . saves erection time.

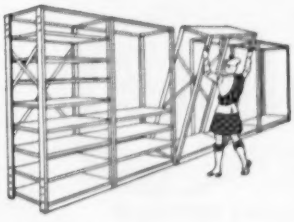


INSERT SHELF SUPPORT BRACKET . . no fumbling with studs, bolts, nuts or lock washers.



TILT SHELF INTO SUPPORT BRACKET . . and you're finished. Shelf is now ready for loading.

Borroughs heavy gauge rolled shaped-post for open shelving gives extra strength, extra value.



Each individual unit is complete in itself . . no part depends on unit next to it . . any unit or shelf can be moved independently.

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A SUBSIDIARY OF AMERICAN METAL PRODUCTS COMPANY OF DETROIT

3002 NORTH BURDICK amp KALAMAZOO, MICHIGAN

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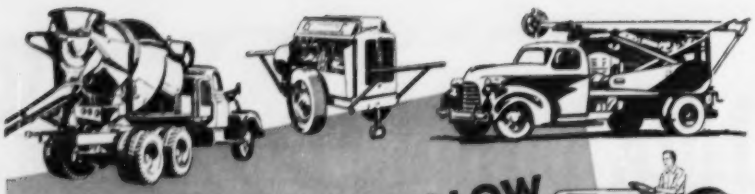
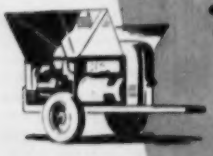
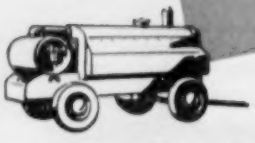


GOOD RULE TO FOLLOW WHEN BUYING ANY SPECIALIZED MACHINE: CHOOSE A MAKE WHOSE BUILDER THINKS ENOUGH OF HIS OWN GOOD NAME TO EQUIP HIS PRODUCT WITH

• CONTINENTAL RED SEAL POWER •

Within Continental's range, from two to 1,100-horsepower, it would be hard to name a type of engine-driven product—vehicle, aircraft, boat, or industrial machine—of which one or more of the leading makes do not rely today on Continental power. As might be assumed from the current trend toward greater specialization, the list of such applications is longer than ever before. The field of Red Seal usefulness has broadened to the point where—as this list suggests—there is almost no end to the industrial uses of dependable Continental power.





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Continental Motors Corporation
MUSKEGON, MICHIGAN

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Calendar of Events

May 2-13
British Industries Fair,
Castle Bromwich,
Birmingham, England

May 12-13
Centennial Engineering Symposium,
Michigan State College,
East Lansing, Michigan

May 16-20
6th Annual National Material Handling Exposition.
International Amphitheatre,
Chicago, Illinois

May 19
5th Ontario Regional Conference,
Packaging Association of Canada,
Walper Hotel,
Kitchener, Ontario

May 31-June 3
Design Engineering Show
Convention Hall,
Philadelphia, Pa.

June 13-25
16th Management Course,
State University of Iowa,
Iowa City, Iowa

June 14-17
2nd Annual Industrial Engineering Seminar,
Cornell University,
Ithaca, New York

June 19-July 2
Material Handling Training Conference,
Lake Placid, New York

July 3-6
Caster & Floor Truck Mfgrs. Assoc.,
Bermuda

July 12-14
Western Plant Maintenance Show,
Pan Pacific Auditorium,
Los Angeles, California

September 6-8
Material Handling Institute,
Greenbrier Hotel,
White Sulphur Springs, West Virginia

September 6-17
Production Engineering and Automation Exposition,
Navy Pier,
Chicago, Illinois

September 6-17
Machine Tool Show,
International Amphitheatre,
Chicago, Illinois

September 20-22
10th Industrial Packaging & Material Handling Show,
Kingsbridge Armory,
New York, New York

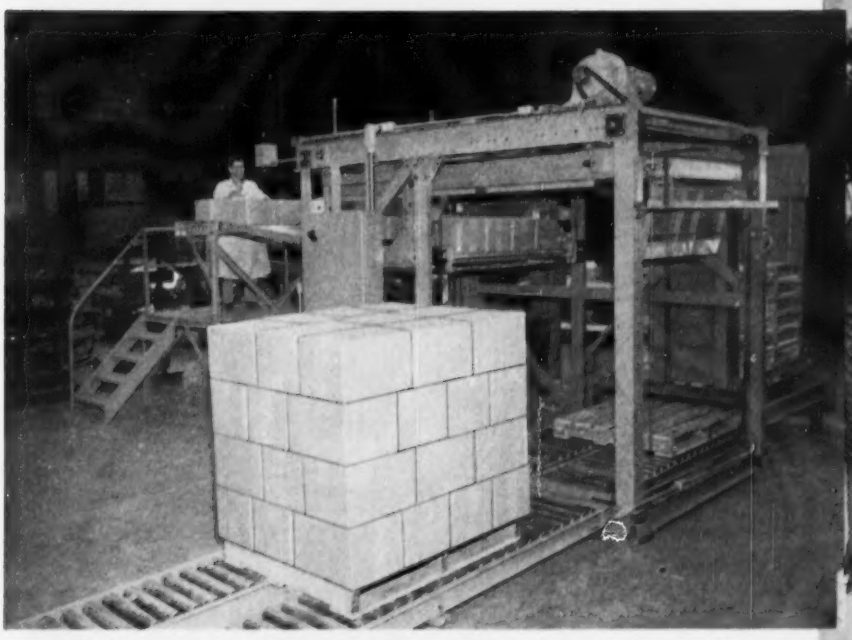
October 5-9
World Plastics Fair & Trade Exposition,
National Guard Armory,
Exposition Park,
Los Angeles, California

GREER

. . . and its authorized dealers from coast to coast in the United States and Canada cordially invite you to visit Booth No. 1751 at the National Materials Handling Exposition to be held at the International Amphitheatre in Chicago May 16th through 20th, 1955.

There you will see the *Palletizer** — a loading machine by Greer — in operation. One man and a Palletizer will load up to three or more times as many cartons or packages as possible by manual methods alone.

Also see the Pallet Dispenser by Greer at Booth No. 1751. We look forward to seeing and talking with you.



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PALLETIZERS are sold and serviced by authorized dealers throughout the U.S. and Canada

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"POWER on DEMAND"

for moving equipment with...

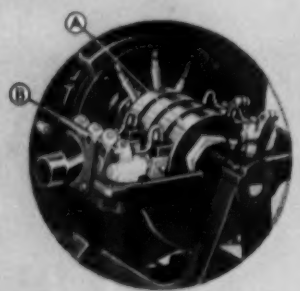
APPLETON REELITE®
Traveling Power Supply

● You can safely speed materials handling... with the correct APPLETON REELITE for your particular needs. APPLETON REELITES for crane, conveyor or other materials handling operations give dependable, year-after-year performance. Cables pay out, latch, and rewind automatically while power flows without interruption. Cable kinking, tangling and breakage are avoided. Before you buy, be sure to investigate APPLETON REELITES... famous for heavy duty quality construction, faultless performance and a minimum of maintenance. Detailed information available on request.

Write for further information, Now!

In magnet lifting operations APPLETON REELITE dependability means unfailing power flow... no dropped loads, improved safety records!

All types of electric, air and liquid models... small and large sizes... unlimited variety of standard hose or cable lengths.



APPLETON engineering and craftsmanship is notable in every REELITE. Copper collector rings "A" are accurately machined and have ample capacity to carry rated current. Brushes "B" set in a floating tension assembly maintain alignment and pressure. Grease packed ball bearings and spring housing require no maintenance.

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Rely on **APPLETON**... *the Standard for Better Wiring*

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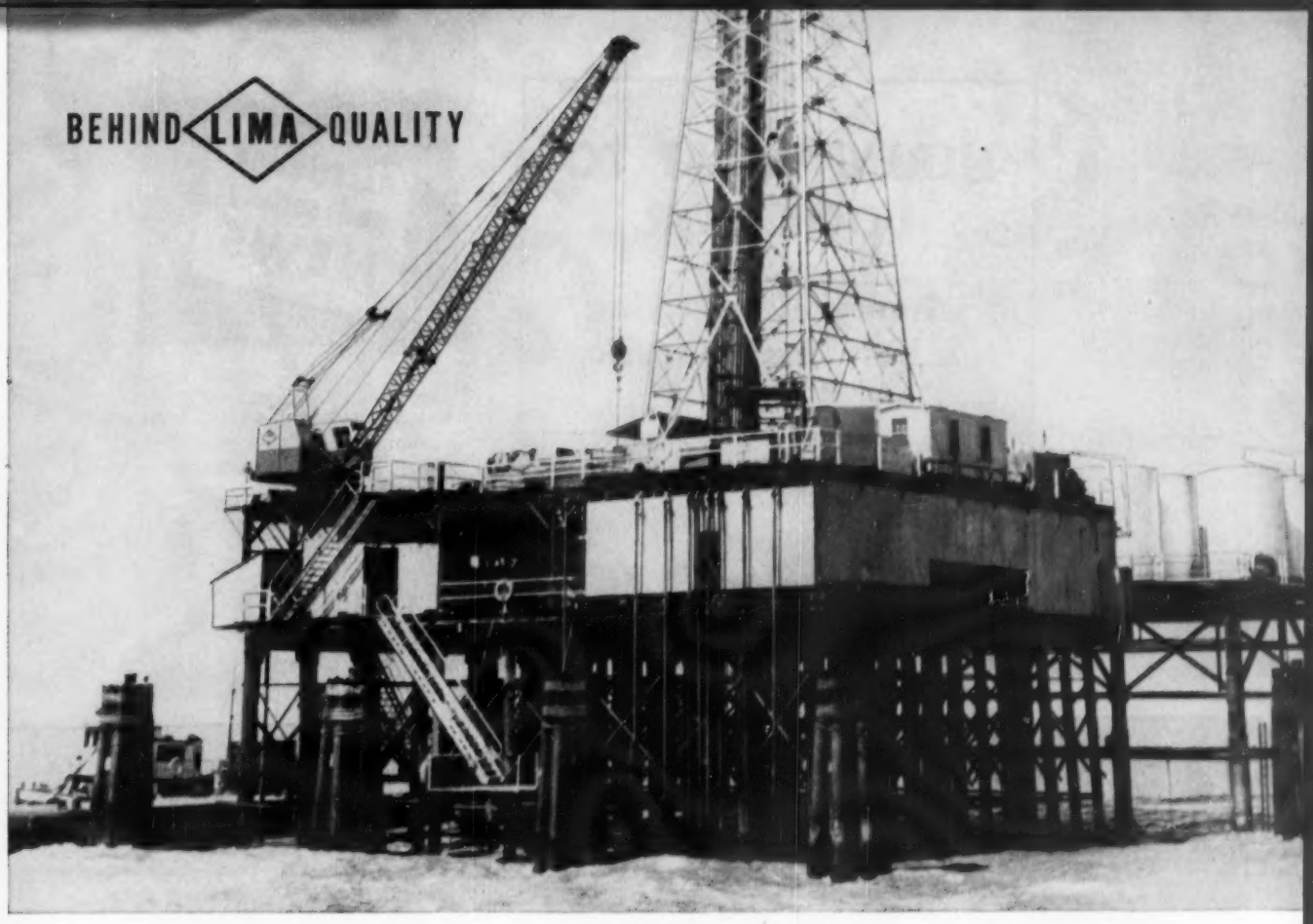

LIMA quality pays off for The Pure Oil Co. 15 miles at sea

Tough service? The Pure Oil Company has a Lima Paymaster crane working 15 miles at sea in the Gulf of Mexico . . . to prove that Lima quality pays off in top performance no matter how rugged the service. Here's what they say about it:

"We've mounted a Lima Type 34 crane on platform E in our Eugene Island Field offshore drilling operations. The Lima machine is used for all materials handling operations aboard the platform. We intend to move it to other offshore rigs when we finish with it at the present location."

Only Lima, designed and built with the emphasis on quality, can give *you* perfect performance on your tough jobs everywhere.

COMPARE QUALITY! No other machine gives you as much as LIMA!

1. Piston-ring-type dirt seal rings and retainers.
2. Moving parts are flame or induction hardened for longer life.
3. Main machinery is placed well back of center of rotation.
4. Anti-friction bearings at all important bearing points.
5. Big capacity drums and sheaves are easy on cables.
6. Propel and swing gears and power take-off are enclosed in a sealed oil bath.
7. Torque converter (optional on certain types).
8. Wherever you are, you can depend on skilled service and nearby warehouse stocks of parts.

COMPARE quality, and you'll specify LIMA for shovels (to 6 yds.), cranes (to 110 tons) and draglines (variable). Smaller capacities available on rubber.

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Construction Equipment Division · LIMA · OHIO · U. S. A.

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HERE'S WHAT TO LOOK FOR

when you're buying a hand pallet truck

MODEL L2P
Capacity 2,000 lbs.

WELDED IN ONE PIECE... head, shoulders and forks. No weak spots.

POLISHED PUMP PISTON plus 7 packings to insure permanent oil seal.

3 GRADUATED BOOSTER ROLLS to provide easy pallet entry.

POLISHED ELEVATING RAM and long-lived packings to prevent oil leakage.

HEAVY DUTY SPRING to hold handle in upright position.

SMOOTH BRAKE PAD to prevent damage to floors.

RUBBER-TIRED FRONT WHEELS ... Bigger, wider ... for easy rolling and floor protection.

RAYMOND

Lightweight HAND PALLET TRUCK

... has all these ... and more. Lightweight ... thanks to aluminum alloy construction. Rugged, yet easy to pull. Foot pedals lift and lower your load.

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association and society NEWS

• **1955 president** of the Association of Lift Truck and Portable Elevator Manufacturers is F. J. Dunleavy of Yale and Towne Manufacturing Company. Other officers include Vice President Arthur Lewis, Lewis-Shepard Products Inc.; Treasurer H. S. Germond, III, Revolvator Company; and Secretary R. Kennedy Hanson, Hanson & Shea, Inc. Popularly known as ALTAPEM, the group is believed to have the longest record of continuous service among associations within the material handling industry. The association is now preparing a comprehensive booklet which will cover types, uses and advantages of hand operated material handling equipment.

F. J. Dunleavy

• **A cruise to Bermuda** will be made by members of the Caster and Floor Truck Manufacturers Association, July 2-8. The group will be ashore for two-and-a-half days, with accommodations at the Elbow Beach Surf Club Hotel.

• **The Fifth Annual Materials Handling Forum** sponsored by the New Jersey chapter of the American Materials Handling Society, Stevens Institute of Technology and the Materials Handling Institute was held at Stevens on March 16. Speakers prominent in the industry delivered addresses on "Management's Responsiblity in Material Handling".

• **All officers** of the Canning Machinery and Supplies Association were re-elected for the year 1955. Re-named were President E. N. Funkhouser, Jr., Dewey and Almy Chemical Co.; Vice President C. K. Wilson, Food Machinery & Chemical Corp.; Secretary-Treasurer W. D. Lewis; and Ex-Officio Hal W. Johnston. Jules Bauer of Interchemical Corp. and William E. Vaughn of American Can Co. were elected to the board of directors.

• **William F. Gates** was elected president of the Cleveland chapter of the American Material Handling Society for 1955-56. New directors include W. H. V. Moore, Ford Motor Co.; R. J. Powell, Jr., Freeway Washer & Stamping Co.; Don Fulmer, The Flexible Co.; and Edward H. Leighten, FLOW Magazine. Gates is with the A. J. Gates Co.

W. F. Gates

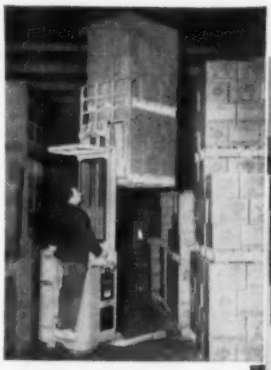
• **Chicago chapter members** of American Material Handling Society inspected material handling operations at Great Lakes Naval Training Station, April 13. The association's annual golf outing is scheduled for June 13 at Elmhurst Country Club.

• **The Philadelphia Regional Division** of the Society of Industrial Packaging and Material Handling Engineers featured a talk on public warehousing at a recent meeting. Guest speaker was Al Lownsbury of Railway Warehouses Inc., Cleveland.

• **Retooling Material Handling** was a topic given consideration by the Society for Advancement of Management and American Society of Mechanical Engineers at their 10th Anniversary Time Study and Methods Conference. Members of the two societies convened in New York City, April 28-29.

Almost 7-Ft. long . . . yet it

TIERS IN 6-FT. AISLES!



RAYMOND

Electric
TIERING TRUCK

Gives you up to
50%
more storage space

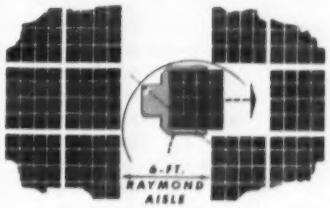
IT'S MAGIC the way this *RAYMOND* Truck tiers in aisles narrower than its own length with load!

Yet, day after day this truck does just that in hundreds of plants and warehouses.

HERE'S THE SECRET . . .

The RAYMOND Truck is extremely compact, has a patented off-set drive wheel with 200° turning arc. This permits it to right-angle stack from 6-ft. wide aisles . . . gives you up to 50% more storage.

Its light weight allows safe operation on low-capacity elevators and floors. 51" free lift enables it to tier in low-ceiling areas without increasing overall height.



NEW LEASE-PURCHASE PLANS!
Now it's easy for you to own or lease any RAYMOND Electric Truck. Three new plans permit you to rent or purchase over 1 to 3-year periods. Ask your RAYMOND representative about these plans!

SEND FOR BULLETIN

RAYMOND

Electric Industrial Trucks
Hydraulic Elevating Equipment

PATENT NO. 2,564,002

The RAYMOND CORPORATION

3364 Madison St., Greene, N.Y.

☐ Please send Bulletins on 2,000 and 3,000 lb. Tiering Trucks.
☐ Please have your representative call.

NAME _____ TITLE _____
COMPANY _____
STREET _____
CITY _____ STATE _____

Circle No. 245 on Reader Service Card for more information

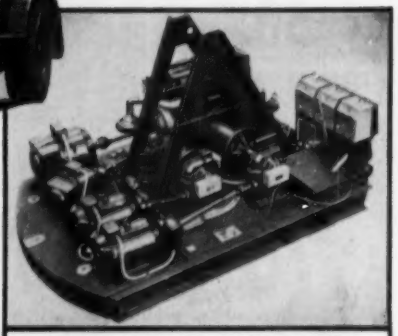
Let COLES CRANES SHOW YOU HOW TO SAVE $10,000.00 plus

Handling Time Cut From Days to Minutes!

*Apart from the automatic savings made on mechanization of material handling, COLES can offer you greater savings with less *fuel consumption, lower maintenance costs, automatic SAFETY devices,* — economies only possible with COLES gas-electric design. Over 20,000 satisfied customers all over the world attest to the operating economy of COLES CRANES. We invite investigation.*

See Coles Demonstrations Booth 833 Material Handling Exposition Chicago, Illinois. May, 1955.

"A Century of Experience Behind Every Crane"



THE ULTIMATE IN TORQUE CONVERSION

There is no comparison with Coles Gas-electric transmission wherever smooth, rapid and accurate positioning is important in handling high ton loads. No gears to shift, no clutch to manipulate, no power absorbing friction . . . in inching movement. Simple to operate, simple to maintain.

THE ONLY CRANE WITH A ONE YEAR WARRANTY

COLES CRANES

COLES CRANES, Inc.
Box 942-F
JOLIET, ILL.

The name that carries weight in material handling . . .

Circle No. 94 on Reader Service Card for more information

news from the SALES FIELD

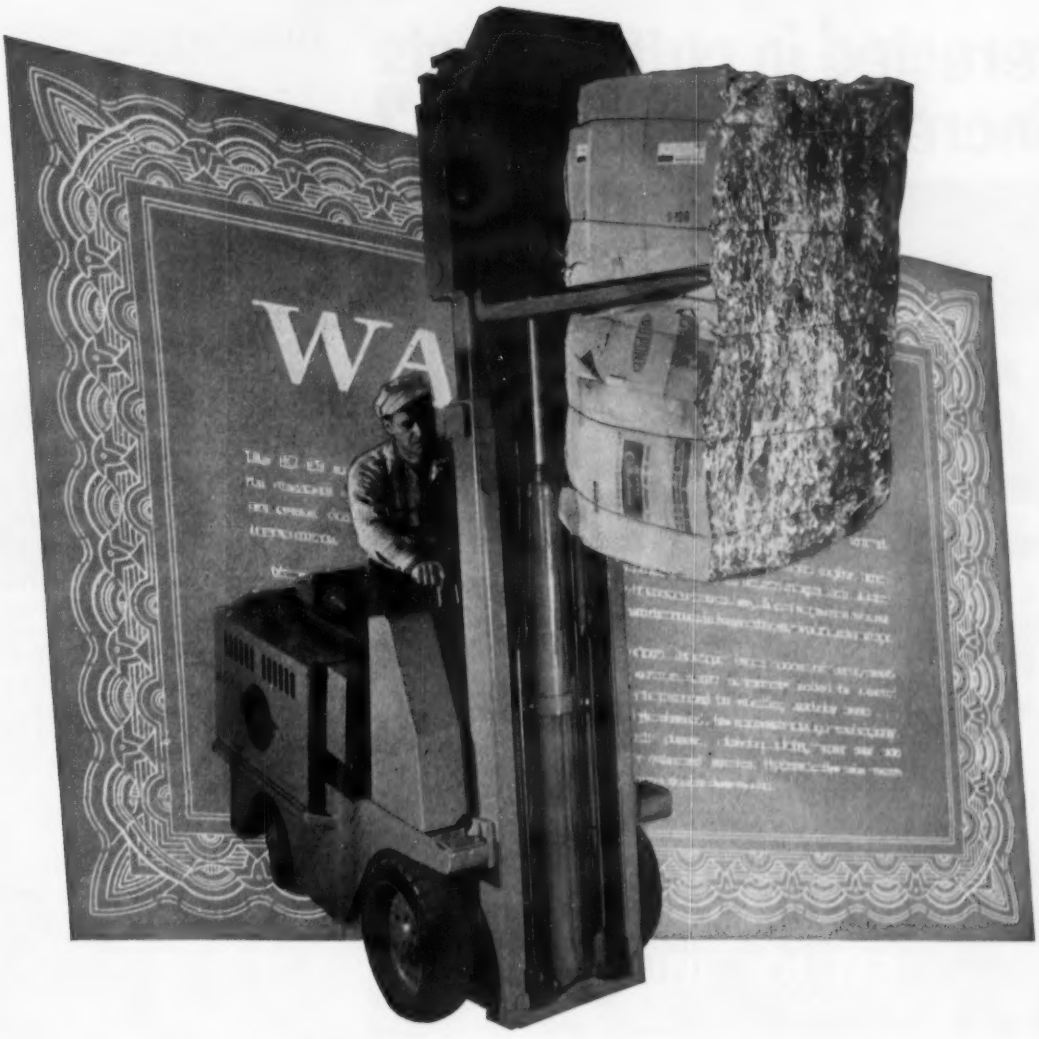
Joseph V. Rozycki has been appointed district manager to head the new branch of **Whiting Corporation (Canada) Limited.** A chemical engineer graduate of the University of Toronto, he has been associated with Whiting for three years. **J. Noel Pierce** is assistant district manager of the office which is located at 660 St. Catherine Street, West Montreal, Quebec.

J. V. Rozycki

Recent appointment of **Lewis W. Bentley** as manager of the Detroit office of **Industrial Crane & Hoist Corporation** has been announced. The office is located at 18431 James Couzens Highway.

American MonoRail Company has appointed the following new distributors: **Newell Equipment Company,** Birmingham, Alabama; **Ken-Dick Corporation,** Moline, Illinois; **Miller Steel & Supply Co., Inc.,** Elkhart, Indiana; and **Voyles Equipment & Engineering, Inc.,** Indianapolis, Indiana.

A "combination deal" on fork truck leasing and maintenance is being offered by **Lift Truck Service Company, Buda Company** distributor in the Chicago area. Under the plan, the fixed cost per hour of operation is known in advance and covers both truck rental and full maintenance. **Chester E. Carner, Jr.,** president of the firm and origi-



Insist on a...

ONE YEAR WARRANTY

when you buy an electric fork truck

All Baker battery-powered industrial trucks—including fork, platform, crane trucks and tractors—are warranted against defects for a full year from date of shipment.

As a truck purchaser, you should accept nothing less.

A one-year warranty assures you that the manufacturer has complete confidence in the materials and workmanship that go into his product. It gives you twelve months protected operation of the truck *under your conditions*—allowing ample time to detect imperfections, which might not show up during a 30, 60 or 90 day guarantee period.

Baker Trucks have a half-century reputation for outstanding performance, long life and low maintenance. For example: a fleet of the first Baker ram trucks ever built is still in service at a large midwestern steel mill after 32 years!

Let a Baker handling engineer give you the full story, or write for Bulletin 54B. The Baker-Raulang Company, 1219 West 80th Street, Cleveland 2, Ohio.

Baker.
handling equipment

512

Circle No. 59 on Reader Service Card for more information

Interested in cutting costs ...increasing production?

Here, in one catalog are cost-saving facts on efficient, processing operations employing Cyclone metal conveyor belts—showing their advantages over costly manual handling and over belts made of other materials.

Cyclone Conveyor Belt Catalog #5 contains the up-to-date story on the entire line of dependable, Cyclone Belts – which constitutes the widest selection of metal belts in carbon, alloy and stainless steels.

This big catalog includes descriptions, photographs and specifications on *all* the types of Cyclone Belts available. Application pictures show how and where Cyclone Belts are saving time and money in many processing and product handling operations. Send the coupon for your catalog.

CYCLONE FENCE DEPARTMENT
AMERICAN STEEL & WIRE DIVISION, UNITED STATES STEEL
Waukegan, Ill.
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS CYCLONE
METAL CONVEYOR BELTS
SPIRAL WOVEN
FLAT WIRE • FLEX-GRID

USS

MAIL THIS COUPON

Cyclone Fence
Dept. A-55, Waukegan, Illinois

Gentlemen:
Please send me your big, illustrated Catalog #5. No charge or obligation.

Name.....
Company.....
Address.....
City.....State.....

UNITED STATES STEEL

Circle No. 42 on Reader Service Card for more information

nator of the plan, says the method enables the user to budget accurately handling costs, just as other expenses.

Recently appointed commercial division field engineer of **Lamson Corporation** is **Louis C. Billings.** In this capacity he will be responsible for sales covering the Island of Manhattan. A graduate of Boston University, he joined Lamson in 1942 and handled special accounting work. In 1951 he was transferred to the sales department, and in 1952 became assistant to the commercial division manager.

L. C. Billings

Exclusive distributor for **Ideal Stencil Machine Company** is **Allen Brothers Corporation,** Boston. The company will service all of New England with the exception of Danbury, Middlesex and New Haven in Connecticut. **J. W. Wales,** vice president and general manager, is the company's top active executive.

Manager of **International Harvester Company's** industrial power central sales region is **W. F. Hall.** He replaces **L. A. Coomer** who transferred to the eastern sales region. Hall began his career with the company in 1939 in Minneapolis, and since that time has served in various capacities. In his present position he will be responsible for sales in 16 central and midwestern states.

Rapistan of New Jersey, Inc. has appointed **Kasper and Koetzle, Inc.,** 576 Bushwick Avenue, Brooklyn, distributors

REPORT FROM DANLY

15 years heavy handling "AROUND THE CLOCK" from 9 Whiting Cranes!

In 1940, Danly Machine Specialties, Inc., a leading manufacturer of mechanical presses, installed nine Whiting Overhead Electric Traveling Cranes in their Chicago plant. These cranes have been in operation practically 24 hours a day, six days a week, for fifteen years. All production moves via these cranes, and Danly depends on them to meet schedules without fail. This phenomenal record is the result of (1) Danly's program of specialized crane maintenance, (2) the foresight of Danly executives and Whiting engineers — working together and planning the installations to meet *future* as well as present needs, (3) the outstanding features built into Whiting Cranes that assure peak performance at low cost. These features, to mention a few, include anti-friction bearings, precision-made gears, securely-fitted shafts and flanged couplings. Send for our new booklets — Unit 79 "How to Select A Crane" and Unit 80 "Presenting Whiting Cranes."

WHITING CORPORATION
15659 Lathrop Avenue, Harvey, Illinois

Cranes • Trambeam • Trackmobile • Chemical Processing, Foundry and Railroad Equipment
Circle No. 293 on Reader Service Card for more information

HERE'S VERSA

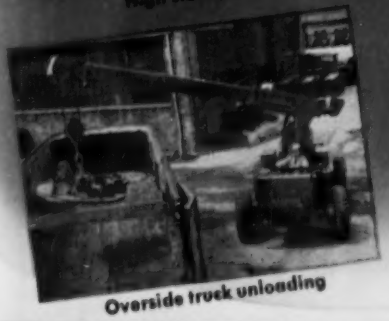
AUSTIN-WESTERN HYDRAULIC CRANE

PRODUCTION "CHAMP"

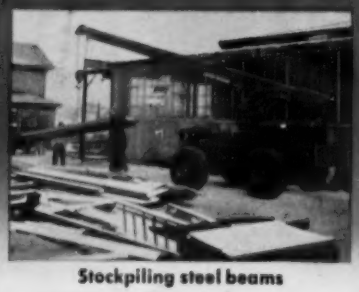
Platform supports load

High storage indoors

It's the LIVE BOOM that makes the difference . . . live power for all boom movements . . . extending and retracting . . . raising and lowering . . . rotating. Finger-tip hydraulic control handles delicate spotting jobs with superb precision. No other mobile crane has a boom so completely "alive" . . . no other outdoor-indoor crane is so well adapted to the handling of materials-for-production.



Overside truck unloading



Stockpiling steel beams

Multi-use magnet

Austin-Western

Power Graders · Motor Sweepers
Road Rollers · Hydraulic Cranes

BALDWIN BLH LIMA HAMILTON

Construction Equipment Division

Manufactured by
AUSTIN-WESTERN COMPANY
Subsidiary of Baldwin-Lima-Hamilton Corporation
AURORA, ILLINOIS, U.S.A.

TILITY!

AUSTIN-WESTERN HYDRAULIC CRANE
MAINTENANCE "CHAMP"

The same exclusive features that make the Hydraulic Crane popular with production departments are responsible for its equal popularity with maintenance departments, where its all-wheel steer for close quarter operation, telescopic boom with 360° rotation, and fast, accurate hydraulic controls make it a "natural" for dozens of maintenance jobs, indoors and outdoors . . . a versatile, always-on-the-job top performer which pays maximum dividends, day in and day out.

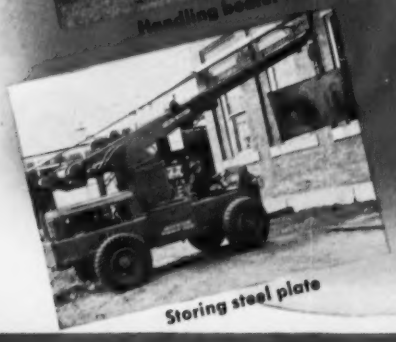
See the Hydraulic Crane at the Materials Handling Exposition, International Amphitheatre, Chicago, May 16-20.

Check overhead lines indoors

Handling beater roller

Changing conveyor chain

Transporting pipe section


Storing steel plate

Magnet handles pipe

Replacing gear

Get all the Facts...

AUSTIN-WESTERN COMPANY
620 Farnsworth Avenue, Aurora, Illinois
Please send complete information and literature on the Austin-Western Hydraulic Crane.

Name _____
Title _____
Company _____
Street _____
City _____ Zone ____ State ____

Circle 54 on Reader Service Card

Attention: Lift Truck Owners! Users!

A low-cost Greer Accumulator makes the big difference!

New Hydraulic Component Takes the Bounce and Jounce Out of Lift Trucks... *FOR GOOD!*

Shock and vibration is common to all hydraulically operated lift trucks. When a lift truck with a heavy load moves or stops suddenly, runs up a ramp, or travels over uneven ground, the bounce and jounce set up by the moving load leaves nothing but the vehicle and driver to absorb the tremendous pounding. The solution to this hazard is the *Greer Accumulator*. Its gas-filled bag cushions shock and vibration to harmlessness. And the money-saving benefits gained far outweigh its low cost in...

Reduced Spillage and Breakage! Fragile glassware, crated eggs, bags of cement – anything can be handled more safely. Less danger of costly delays and customer claims for damaged goods.

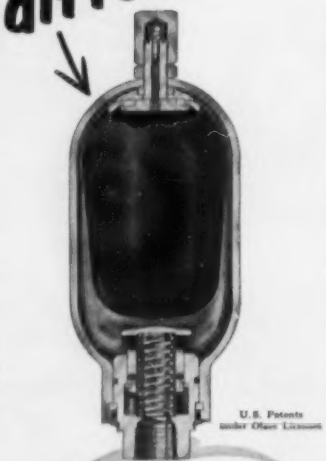
Improved Performance! Lift trucks move faster up ramps, over rough flooring and ground. Loads stay put. No bounce or jounce to shift crates.

Less Operator Fatigue! Driver rides more comfortably with closer control of direction and load. Work flows smoothly without slowdowns.

Longer Lift Truck Life! Less downtime, less maintenance when vehicle is rid of damaging shock. Parts last longer, perform better, too.

Learn how a simple pipe-tee and hose connects Greer Accumulator to system easily, quickly, and at low cost. Call or write your dealer for brochure.

GET ALL THE FACTS TODAY!
SEE YOUR LIFT TRUCK DEALER!



Be sure your next lift truck is equipped with one!

Manufactured by Greer Hydraulics Inc. · Jamaica 30, New York

Circle No. 136 on Reader Service Card for more information

Continued

in the Metropolitan New York area. The firm is offering consultation on special manual handling problems, and immediate delivery of casters and wheels from stock.

Spring Wood Products, Inc. has opened a branch office at 3134 Euclid Avenue, Cleveland. **Carl W. Goodwin,** who recently joined the organization as sales manager, will head the new office. Assisting him in planning and engineering will be engineers from the home office in Geneva, Ohio.

C. W. Goodwin

Two new distributors have been appointed to handle the Michigan line of **Clark Equipment Company.** They are **Charles Dunn Machinery, Inc.,** 1915 Locust Street, Kansas City, Missouri and **Midwest Equipment Company** at Fargo and Bismarck, North Dakota.

Brandon Equipment Company, Chicago, is distributing **R. M. Hollingshead Corporation** products to the railroad industry. **D. I. Packard,** president and general manager of the Brandon organization, said that initially the company will handle only the Cocoon products. The firm maintains headquarters in Chicago and has sales representatives in Washington, D. C., New York, Los Angeles and St. Paul.

Recent winners in a six-week quota sales contest conducted by **Bowers Battery & Spark Plug Company** were: **Kenneth Franks,** Manchester, Pa., warehouse manager; **Joseph Polin,** Philadelphia, branch manager;

its Advantages are turned to greatest account by Louden

Overhead handling possesses fundamental and inherent advantages over any other system. And Louden's pioneering experience, broader range of equipment and engineering knowledge turn these advantages to greatest account in planning a handling system for you. The American Stamping Company, Cleveland, Ohio, installation shown here is a typical example. The customer's needs were limited. He wanted a much better die storage system in his new building than he had in his old. Louden had the engineering knowledge *but it also had the equipment the customer needed* . . . a stacker crane. Because this was so, storage facilities could be restricted to a small area with narrow aisles between racks. Yet the stacker crane, suspended from the rails above, moves freely and maneuvers freely in these aisles. It is operated by any one of the stamping machine attendants.

Louden is unique in the engineering vision and experience it brings to your problem . . . and in the wide range of equipment it has to draw upon. Louden overhead handling saves labor and cuts handling costs sharply. Louden handling travels more swiftly, speeds operations, often leads to increased production. Louden permits maximum utilization of floor space and air space too. It repays its cost within a year . . . within months . . . has done so within weeks. The least you should do is see what the best in engineering recommends. Then will be time for you to decide.

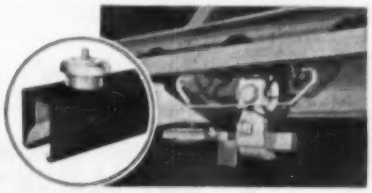
No more crowded, cramped stacking of dies along walls and needlessly wide aisles for trucking. In new American Stamping Co. building, Louden's engineering and equipment confine storage to 40 x 40 feet. Stacker crane moves on runways *above*, negotiates narrow aisles between racks easily, handles dies in and out of racks with delicacy, precision and speed.

Louden

MONORAIL & CRANES

THE LOUDEN MACHINERY COMPANY • 5305 Broadway, Fairfield, Iowa

A Subsidiary of Mechanical Handling Systems, Inc.



New! Louden Shokpruf Electrification . . . for all monorail and crane installations. Hazards of open conductor bars now completely overcome by this exclusive Louden engineering development. Write for full details of this safe conductor system.

SINCE 1867 . . . THE FIRST NAME IN MATERIALS HANDLING

Circle No. 192 on Reader Service Card for more information

SHEPARD NILES
Crane

PERFECT CONTROL

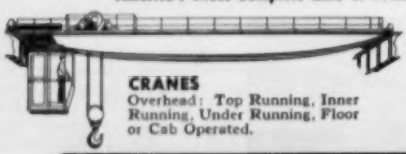
for every load you lift . . .

LIGHT LOAD OR HEAVY, your load is under complete control when you handle it with a Shepard Niles Crane. The Magnetic Control system puts reliable lifting power . . . smooth, safe overhead travel . . . and precision spotting at your fingertips. No wonder cranes bearing the Shepard Niles name serve so many American plants.

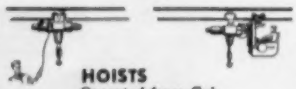
All component parts in Shepard Niles Cranes are designed and built by Shepard Niles especially for crane service . . . your assurance of extra years of dependable, trouble-free operation. Light, medium and heavy-duty cranes are offered for the work your service demands. Available in slow, medium and high speeds . . . floor, cab or pulpit operated.

Send for latest Crane Bulletin or request a Shepard Niles representative to call and talk over your plant's handling needs. He's well qualified to recommend the crane that meets your requirements.

America's Most Complete Line of Cranes and Hoists since 1903



CRANES
Overhead: Top Running, Inner Running, Under Running, Floor or Cab Operated.



HOISTS
Operated from Cab, Floor or Pulpit.

SHEPARD NILES
CRANE AND HOIST CORPORATION

2753 SCHUYLER AVE., MONTOUR FALLS, N.Y.

Circle No. 11 on Reader Service Card for more information

and **James Croghan,** Secane, Pa., branch salesman. The men will be accompanied by their wives on an expense-paid week's visit at the Miami home of **Clarence P. Bowers,** company president.

A former employee with 18 years service with **Bucyrus-Erie Company, John H. Plehn,** has rejoined the sales staff. He will work out of the Seattle office, which is headed by **R. P. Brooks,** northwestern sales manager. From 1949 through 1953, Plehn was a sales representative for tractor equipment in the San Francisco area, when the company terminated tractor equipment sales.

J. H. Plehn

Three new distributors have been signed by **The Cambridge Wire Cloth Company.** They are: **The Harold G. Taylor Company,** Toledo, Ohio; **Haven Mill Supply Company,** Winter Haven, Florida; and **Richard W. McCrone, Jr.,** Gainesville, Texas.

C. Raymond Ahrens has been appointed manager of the New York sales district of **Ohio Hoist & Manufacturing Company,** an affiliate of **Dickey Industries.** President of the corporation which bears his name, Ahrens maintains offices at 30 Church Street, New York City.

A new branch at Lakeland, Florida has been opened by **Freeman & Sons, Inc., Hyster Company** dealer. The company maintains headquarters in Miami, Florida, and also has a branch in Jacksonville.

PHOTO COURTESY YALE MATERIALS HANDLING DIVISION, THE YALE & TOWNE MANUFACTURING COMPANY, PHILADELPHIA, PA.

...down go costs with modern fork lift trucks powered and protected by Chrysler Power Partners

Costs come down when a modern fork lift truck is on the job. That's because these little giants will tackle anything around the plant or warehouse—unload, carry, stack and load it faster, safer and save space and personnel doing it.

It's a fact. Modern fork lift trucks, like the highly regarded Yale Industrial Lift Trucks pictured here, have been credited with savings up to 50% in handling costs. Yale 51 Series Gas Trucks in ranges from 3,000 to 10,000 pounds capacity are all Chrysler-powered. Here, hard at work in a midwest building supply company warehouse, are two 4,000 pound capacity Yard Kings. They are stacking cement and roofing materials in tiers so as to take greatest advantage of every inch of valuable space.

Chrysler Ind. 30 230 cubic inch displacement six-cylinder engines power these units. All power impulses are transmitted through Chrysler gyrol Fluid Coupling, not only enabling oil-smooth, easy-to-learn, easy-to-handle operation, but also extending clutch life and cushioning engine and transmission from shock loads.

In materials handling equipment or any equipment requiring lightweight, high-speed industrial power in compact, easily-installed engines, you can depend upon Chrysler Industrial Engines—230 to 413 cubic inch displacement. For added adaptability each can be factory-equipped for gasoline or LPG operation. You may also specify Chrysler gyrol Fluid Coupling factory installed.

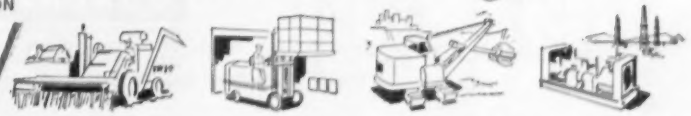
Remember too, Chrysler Industrial Engines are not expensive. Production-line methods adapted to specialized industrial engine building provide a custom-built engine at mass-production prices. See a Chrysler Industrial Engine Dealer or write: ***Dept. 205, Industrial Engine Division, Chrysler Corporation, Trenton, Michigan.***

CHRYSLER INDUSTRIAL 30 ENGINE
230 CUBIC INCH DISPLACEMENT

CHRYSLER *Industrial Engines*

INDUSTRIAL ENGINE DIVISION • CHRYSLER CORPORATION

HORSEPOWER WITH A PEDIGREE

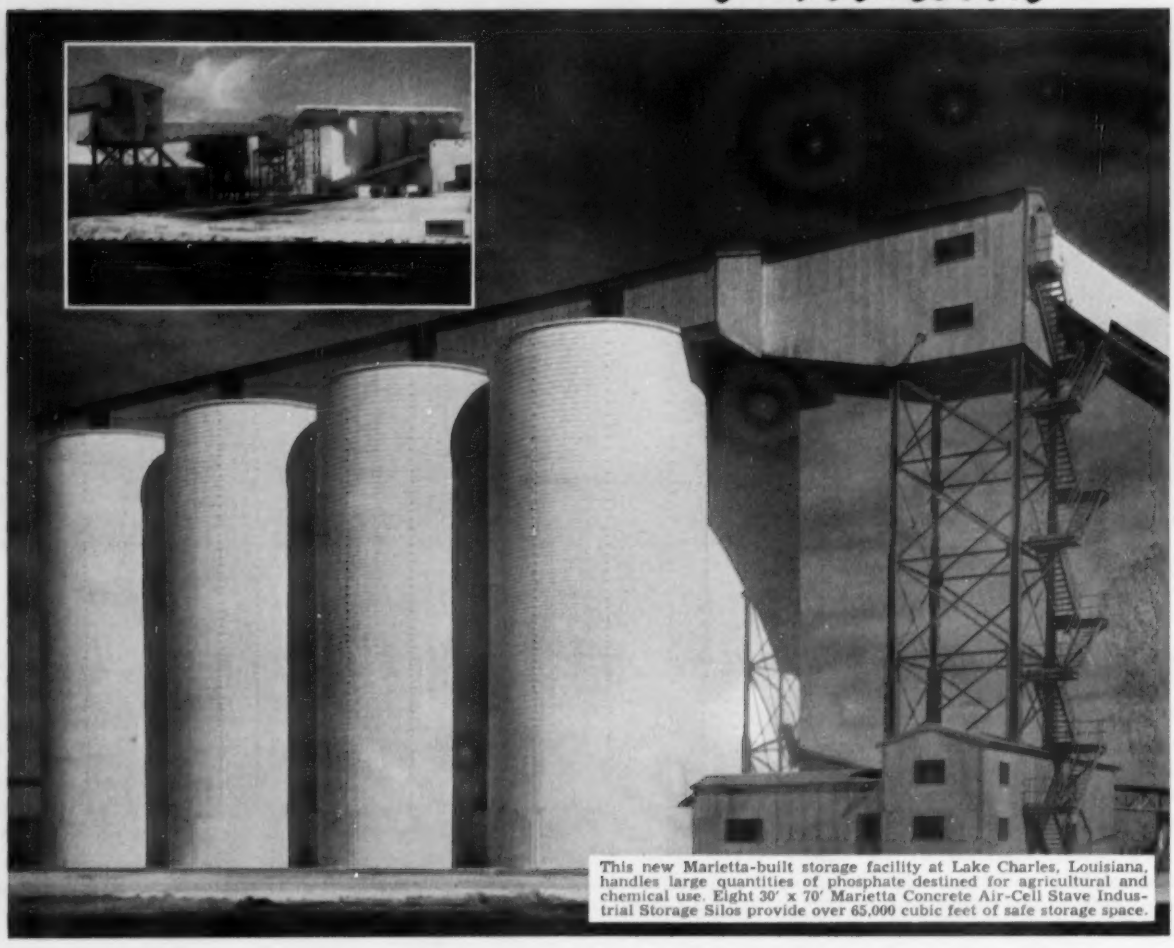


AGRICULTURE • INDUSTRY • CONSTRUCTION • OIL FIELDS

Circle No. 7 on Reader Service Card for more information

protect your production . . .

with Marietta



This new Marietta-built storage facility at Lake Charles, Louisiana, handles large quantities of phosphate destined for agricultural and chemical use. Eight 30′ x 70′ Marietta Concrete Air-Cell Stave Industrial Storage Silos provide over 65,000 cubic feet of safe storage space.

CONCRETE INDUSTRIAL STORAGE SILOS

Give valuable materials the protection they deserve in moisture-free, fire-safe, adaptable Marietta Concrete Stave Silo Storage Systems.

Even hurricane-whipped rains cannot penetrate the walls of Marietta storage installations . . . an invisible barrier of silicone waterproofing effectively seals pores in the concrete exterior coating . . . eliminating formation of destructive efflorescence and reducing weathering and spalling. In addition to effectively lengthening the life of exterior finish coating, silicone treatment prevents ugly staining by soot or chemical dusts.

Marietta Concrete Storage Systems are designed by experts in industrial materials handling. Your operations can benefit from Marietta's wide experience . . . write or wire today . . . you'll be pleasantly surprised to find how economically these cost-cutting, efficient storage systems can be supplied . . . yet "tailored" to your own specific needs! Send for your copy of our silo storage catalog.

Precast Concrete Products for Farm, Home and Industry

THE Marietta CONCRETE CORPORATION Marietta, Ohio

BRANCH OFFICES: 501 Fifth Ave., New York 17, N. Y.; Pulaski Hwy. at Race Rd., Baltimore 21, Md.; 411 Foster St., Nashville, Tenn.; Box 5192, Charlotte 6, N. C.; Hollywood, Fla.; Box 592, Jamestown, N. Y. REPRESENTATIVES in principal cities.

Circle No. 232 on Reader Service Card for more information

JERVIS B. WEBB

CONVEYOR ENGINEERING, MANUFACTURE, INSTALLATION and AUTOMATION

SPEED PRODUCTION FROM RAW MATERIALS TO FINISHED PRODUCT WITH WEBB CONVEYORS

Webb conveyor systems speed production and reduce costs in the handling of bulk materials, parts and finished products. For, regardless of material to be handled, Webb manufactures conveyors that will exactly meet every need and Webb engineers have the installation experience to secure highest efficiency.

Here's how a paper mill utilized Webb conveyors and engineering to obtain best possible materials handling throughout their entire manufacturing operation. In the woodyard, a daily supply of thirteen hundred cords of pine logs from four states is unloaded from railroad cars and trucks onto three Webb chain conveyors. Two conveyors take logs directly to the chippers while third conveyor can carry the logs either to the chippers or storage stacker shown above.

This stacker, which is the largest in use today, is approximately 300 feet long and rises 80 feet in the air. Up to 30,000 cords can be stored by the stacker. Additional chain, belt, drag, screw and apron conveyors automatically perform such functions as: removing chips from storage bins, carrying chips to digester, and conveying bark to storage or boiler house. Even coal from railroad cars is carried on conveyors to the crusher and then automatically distributed to the boilers.

Within the mill a Webb conveyor system handles rolls 6 feet in diameter and 10 feet long. These rolls, which weigh 10,000 pounds, are carried on roller flight conveyors and slat conveyors from cutting and gluing to banding and weighing. Also, through use of a selector mechanism, finished rolls are sent either to storage or to a slat conveyor located on the shipping dock. 4463

Write to us on your company letterhead and we will be happy to place your name on the Webb mailing list to receive factual technical information on conveyor installations, case history reports, and new product literature.

JERVIS B. WEBB CO.

Specialists in Custom Conveyor Systems

8935 ALPINE AVENUE • DETROIT 4, MICHIGAN

Offices and Representatives Throughout The World • FACTORIES: *Detroit* • *Los Angeles* • *Hamilton, Ontario*

Circle No. 290 on Reader Service Card for more information

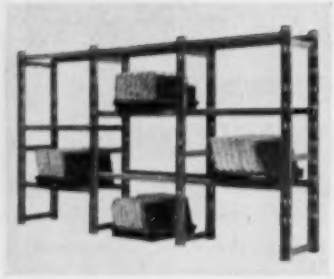
in Equipment

Summaries of latest information from manufacturers. For more details, use the free-mailing Reader Service Card.

Radio Features Improved Performance

General Electric Company has announced a complete new line of FM mobile and base station two-way radio communication equipment for both 25-54 megacycle and 144-174 megacycle land-mobile radio services. Called the Progress Line, the company claims many mechanical and electronic improvements in the units, resulting in improved performance, freedom from obsolescence and easier, greatly simplified maintenance. The control head may be mounted anywhere convenient, and the microphone may be removed easily.

Circle No. 301 on Reader Service Card for more information



Adjustable Storage Racks

Adjustable storage racks with improved design features are announced by Palmer-Shile Company. Complete tiering range is possible, using the racks in single, double or multiple sections. Double slots are set at an angle on the vertical uprights, giving extreme rigidity and preventing swaying, according to the manufacturer. Adjustable members may be removed by hand and placed at any desired level. Braces are welded to front and back panel uprights for depth specified.

Circle No. 302 on Reader Service Card for more information

Walk-or-Ride Tractor

Greater warehouse efficiency through faster, safer order picking is claimed by Yale & Towne Manufacturing Company for its newly developed Model MTR Worksaver Rider Tractor. The unit can be operated as a stand-up rider or walkie truck. Normal draw bar pull is 200 pounds and maximum is 700 pounds. Two speed control gives acceleration to two mph loaded or three mph empty. All the safety features of the Worksaver trucks have been incorporated in the new tractor which is controlled by manipulating the steering handle.

Circle No. 303 on Reader Service Card for more information

Pneumatic-Tired Casters

A new P-R series of pneumatic-tired casters for floor trucks is available from The Hamilton Caster & Mfg. Co. Designed to meet the requirements of specific job applications, the casters are recommended for use where heavy loads, fragile merchandise and similar types of cargo must be transported in utmost safety, and with minimum load jar. Available in both rigid and swivel models, there is a choice of three wheel sizes in each model, all equipped with roller bearings. Tires are four-ply, with separate inner tubes.

Circle No. 304 on Reader Service Card for more information

GUIDE-O-MATIC SYSTEM

SEE GUIDE-O-MATIC DEMONSTRATION AT BOOTHS 1707-13

The Guide-O-Matic tractor is *completely* automatic . . . requires no operator—no physical connectors. Overhead guide wire controls movement along predetermined routes at any desired speed—down aisles, into stock rooms, wherever material is to be loaded or discharged. Guide-O-Matic is always under the constant control of signal boxes installed throughout your plant. A time and labor-saver for handling packaged goods, machined parts, containers, lumber—order picking.

Let a Barrett engineer develop a Guide-O-Matic route to suit your needs. The coupon will bring full details, promptly.

BARRETT-CRAVENS COMPANY
614 Dundee Road • Northbrook, Illinois
Representatives in all principal cities
Canadian Licensee: S. A. Armstrong, Ltd., Toronto, Canada

GUIDE-O-MATIC DOES MORE . . . AUTOMATICALLY

Barrett Handling Equipment

BARRETT

ONE MAN DOES MORE THAN 3 OR 4 . . . WITH A BARRETT

BARRETT-CRAVENS COMPANY
614 Dundee Road, Northbrook, Illinois
Send my copy of the Barrett Guide-O-Matic catalog No. 552-1.

Name ..... Title .....

Company .....

Address .....

City ..... Zone ..... State .....

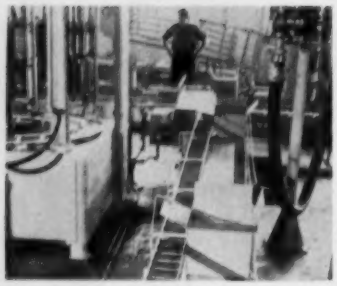
Circle No. 64 on Reader Service Card for more information

Continued

Economical Portable Crushing Plant

A newly-designed Austin-Western single-pass, diesel-electric portable crushing plant is offered by Baldwin-Lima-Hamilton Corporation. Construction Equipment Division. The unit features economy of operation and maintenance, as chains, idlers, sprockets and clutches have been eliminated. Capable of producing two sizes of material, the plant is said to have good application on jobs where high portability and ease of operation are required.

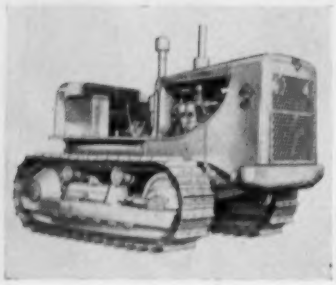
Circle No. 305 on Reader Service Card for more information



Automation Belts

Automation conveyor belts, designed to meet the needs of new manufacturing concepts in all industries, are available from The B. F. Goodrich Company Industrial Products Division. Said engineered to assist the automatic manufacture, assembly, inspection and preparation of products for shipment, the line features a tan Koroseal belt with resistance to abrasion, oils, grease and most acids, according to the manufacturer. Other belts in the Automation line include Highseal, Cariall and Economy.

Circle No. 306 on Reader Service Card for more information



Diesel Crawler Tractor

Allis-Chalmers Manufacturing Company is offering a new crawler tractor. Called the Model HD-16, the 31,500-pound tractor is available with torque converter drive and standard transmission. Highlighted is a six cylinder, 844 cubic inch diesel engine which develops 150 net engine hp at 1800 rpm with torque converter and 140 net engine hp at 1600 rpm with standard transmission. Maximum drawbar pull is 60,000 pounds with torque converter and 31,700 pounds with standard transmission.

Circle No. 307 on Reader Service Card for more information

Automatic Digital Controller

American Electronic Mfg., Inc. has developed a compact automatic digital controller suitable for batch mixing, automatic valve control and similar operations. The controller, with a count capacity of 2500, adds and subtracts automatically at rates up to 20 decimal digits per second with an accuracy of 0.04 percent. The count is shown on four illuminated windows by an Inditron tube. Photo cells or similar devices are commonly employed in the system.

Circle No. 308 on Reader Service Card for more information

Loader Speeds Work Cycles

More than 3000 tons of material can be handled per day with the new Model B-68 straight-line bucket loader, says N. P. Nelson Iron Works, Inc. With a rated capacity of ten tons per minute, the unit features hydraulic crowd, power steering, hydraulic controls, 20 mph road speed, 115 hp engine, four-wheel drive with four-wheel booster brakes, and complete accessibility for maintenance. The loader is said to speed up working cycles of the largest trucks by eliminating jockeying and distributing material evenly.

Circle No. 309 on Reader Service Card for more information

(Continued on page 243)

"PALITON"

The proved COST-CUTTER

with all the advantages

One Large Capacity—
4,600 lb.—at the
Same Low Price

●

Fork Lengths 36"-42"-48"
Widths 20½" and 27"
Specials to Order.

●

Five Inch Hydraulic Lift.

●

Threeway Control for
Raise, Lower and
NEUTRAL Giving FREE
HANDLE for Towing.

●

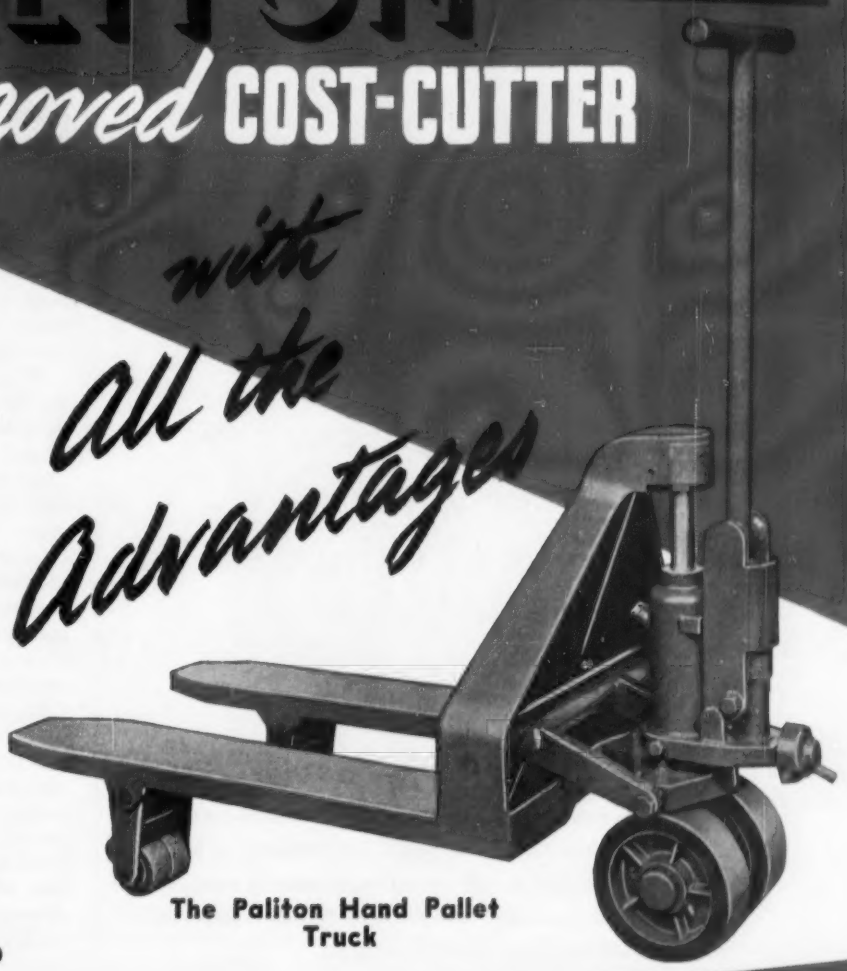
Overloading Prevented
By Pre-Set Relief Valve.

●

STOCKS AND SPARES
HELD BY ALL OFFICES

●

WRITE FOR ILLUSTRATED
LITERATURE:



The Paliton Hand Pallet Truck

HEAD OFFICE:

OMIC, Ltd.,

9 George St.,
London, W.1. England

CANADIAN OFFICE:

c/o CONVEYANCER,

18 Ingram Drive at Keele Street,
P.O. Box 14, Station D,
Toronto, Ont., Cherry 1-1581

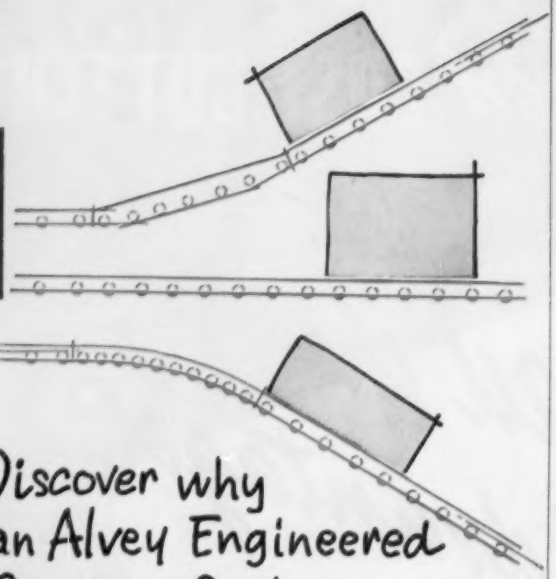
PHOTOGRAPH BY COURTESY OF FRIGIDAIRE DIVISION OF GENERAL MOTORS LTD.

NEW YORK OFFICE:

PALITON, Inc., 40 West 29th St., New York 1, N.Y., Murray Hill 5-9323

Circle No. 3 on Reader Service Card for more information

Call Alvey First



Discover why an Alvey Engineered Conveyor System is better

IT'S THE KNOW-HOW

When you call ALVEY, you'll meet one of our trained Conveyor Engineers. You'll find him easy to talk to. Probably he has recent experience in your type of business . . . experience that he can devote to solving your specific problems.

He'll show you how to lower handling costs . . . synchronize the delivery of materials in production . . . and to eliminate "bottlenecks" in your plant.

If you want action that will save you money . . . call ALVEY today! You have nothing to lose but your package handling problems.

Every time you MANhandle a package, you add to the cost and nothing to the value; therefore, put your packages on Alvey Conveyors that are engineered to fit your individual requirements.

ALVEY

ALVEY CONVEYOR MANUFACTURING COMPANY

9299 Olive Street Road, St. Louis 24, Missouri

Branch Offices in Principal Cities

173

Circle No. 29 on Reader Service Card for more information

WE may be prejudiced, because of our closeness to the subject, but we sincerely believe this issue of FLOW is the most significant editorial presentation ever offered the material handling industry.

We've been fortunate in securing the help of some of the country's leading authorities in forecasting the future of material handling and its effect on the national economy in the next decade. Naturally, the trend is toward increased mechanization to increase productivity. And, along these very lines, Don G. Mitchell, chairman and president of Sylvania Electric Products, has some pertinent views with which we agree.

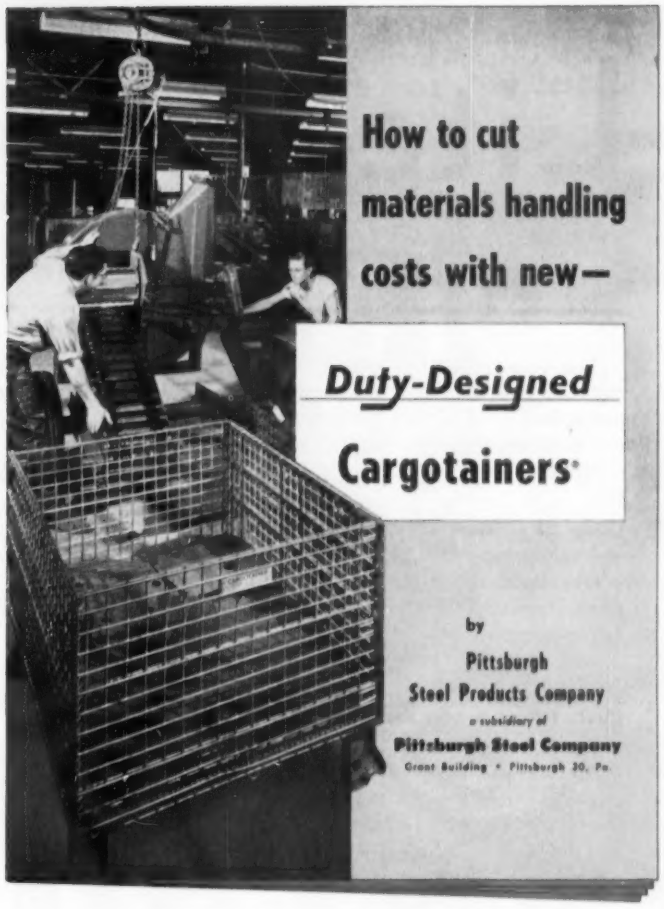
He believes increasing mechanization and the establishment of new industries resulting from technological change will increase the nation's productivity by at least 40 percent over the next decade.

Commenting on the influence of new, improved machinery on employment, Mr. Mitchell says, "No machines have actually displaced anybody. Those displaced by new machines not only have found new jobs, but the very machines which displaced them were part and parcel of a steady trend which has increased their standard of living."

Citing some statistics on employment, he stated that industry employed about 44 million persons in 1947, and that in 1954 there were 51 million persons employed. Yet, if production techniques had not changed between 1947 and 1954, it would have required 59 million to produce the goods and services demanded in 1954—a working force the American population could not have furnished.

"Without increased mechanization," he says, "without labor-saving devices and overall greater production efficiency, the public's needs simply would not have been met."

How to Estimate Your Materials-Handling Savings With *Cargotainers*®



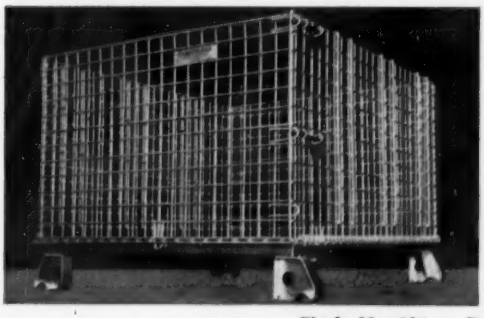
This new 24-page booklet, "How to cut materials-handling costs with new Duty-Designed Cargotainers," is packed with factual information obtained from leading manufacturers of all kinds of products. It contains actual case histories with photos showing Cargotainers at work on production lines moving all kinds of products from food, auto parts, pipe fittings to textiles. It shows the many different types of folding, stacking Cargotainers from stock models to special designs for your particular merchandise.

Send today for your free copy. It's yours for the asking.

Pittsburgh Steel Products Company

a subsidiary of Pittsburgh Steel Company

1403 Grant Building • Pittsburgh, Pa.



Gentlemen: Please send me your 24-page booklet "How to cut materials-handling costs with new Duty-Designed Cargotainers" without cost or obligation.

NAME *TITLE*

COMPANY

ADDRESS

Circle No. 231 on Reader Service Card for more information

Literature

featured in this month's advertisements

The Camel . . . has served as an over-land conveyor for centuries, but it's a far cry from the automation equipment of today, says Allied Steel and Conveyors, Inc.

Circle 26 on Reader Service Card

Overhead Handling . . . possesses fundamental and inherent advantages over any other system, according to The Louden Machinery Company.

Circle 192 on Reader Service Card

No Other . . . fork truck manufacturer builds its own engines—diesel, gasoline and LP gas, says The Buda Division of Allis-Chalmers Manufacturing Co. Buda tells why it can supply a more costly engine at no extra cost to you.

Circle 81 on Reader Service Card

Discover Why . . . an Alvey engineered conveyor system is better, suggests Alvey Conveyor Manufacturing Co.

Circle 29 on Reader Service Card

Whatever You Move . . . American will move it faster and at lower cost, according to The American Pulley Company.

Circle 39 on Reader Service Card

Free Trial . . . is offered by Ideal Stencil Machine Co. The automatic stenciling machine will cut your shipping costs, says this company.

Circle 166 on Reader Service Card

Quality Pays . . . for Pure Oil Co. 15 miles at sea. Find out how from Baldwin-Lima-Hamilton Corp.

Circle 60 on Reader Service Card

Why Freeze . . . your plant to a fixed bulk handling system, asks Tote System, Inc. The company offers an economical, flexible and expandable bulk handling system.

Circle 278 on Reader Service Card

Special . . . machine needed? Economy Engineering Co. asks that you consult with their engineers, who'll build a machine to fit the job.

Circle 114 on Reader Service Card

Man's Best Friend . . . material handling-wise is a Sterling, says Sterling Wheelbarrow Co. Seven features of the equipment are pointed out.

Circle 268 on Reader Service Card

Take It Up . . . with R & M, suggests Robbins & Myers Inc. The hoist manufacturer tells why you can rely on its equipment.

Circle 249 on Reader Service Card

Free Analysis . . . is offered by B. F. Goodrich Company to help you save money on tires and wheels.

Circle 144 on Reader Service Card

Continuous-Flow . . . conveying systems were begun by Mathews Conveyer Company in 1905. This year the manufacturer notes its 50th year of progress and looks forward to the future.

Circle 202 on Reader Service Card

Colors . . . that roll on dry are said by Minnesota Mining and Manufacturing Co. to have revolutionized lane marking methods. Eight plastic tape colors are available.

Circle 210 on Reader Service Card

The Sky's The Limit . . . when you build with Unistrut flexible metal framing, says Unistrut Products Co. How an Indiana department store cut handling costs with Unistrut racks is told in cartoon form.

Circle 285 on Reader Service Card

Excessive Loads . . . are indicated by Martin-Decker Corporation's SB-10 Crane Weight Indicator, before the equipment is overtaxed. A dial on the control tells the operator the weight, boom radius and lifting capacity, and even lets him tally weights while he's loading.

Circle 200 on Reader Service Card

Electronic Sorting . . . of 18 product lines is accomplished easily at Lever Bros. through use of Lamson Corporation's sorting conveyor system. Read the complete story for details.

Circle 181 on Reader Service Card

Reduce Maintenance Costs . . . as much as 30 percent with an LP gas-operated Lamson Mobilift truck, suggests Lamson Mobilift Corporation. The trucks are said to offer economical operation, long life and versatility.

Circle 182 on Reader Service Card

A Better Way . . . to convey light products is depicted by Union Steel Products Company. Find out how Wendway conveyors can help you.

Circle 283 on Reader Service Card

Money In The Bank . . . is what you'll have, if you install unitized flexi steel shelving, according to Borroughs Manufacturing Co.

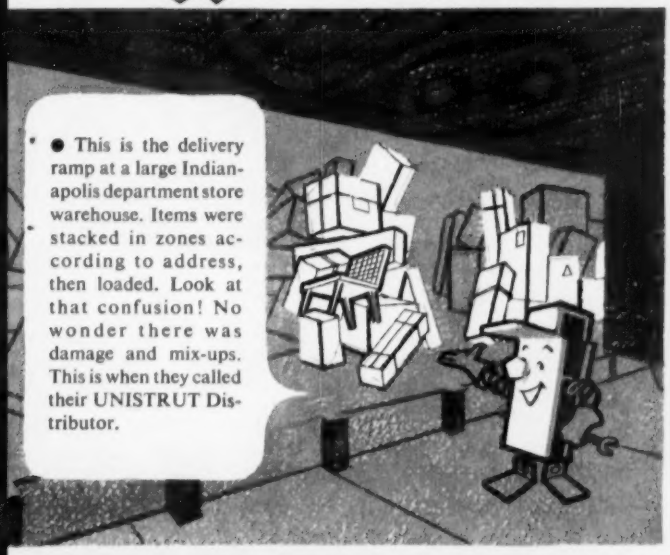
Circle 63 on Reader Service Card

Circle No. 285 on Reader Service Card →

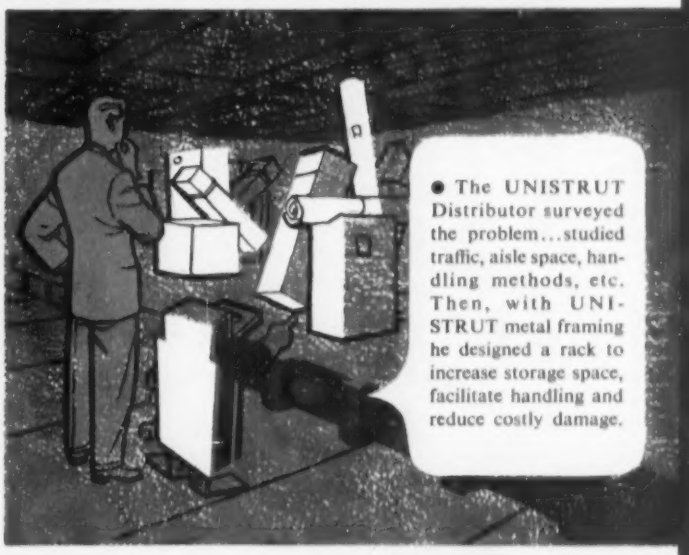
"The Sky's The Limit"

—when you build with UNISTRUT®

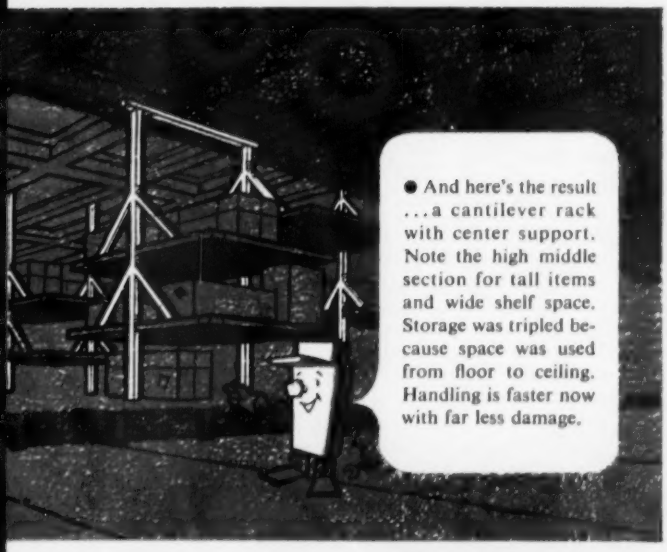
Mr. Strut cuts handling costs for Indiana department store with unique UNISTRUT® rack



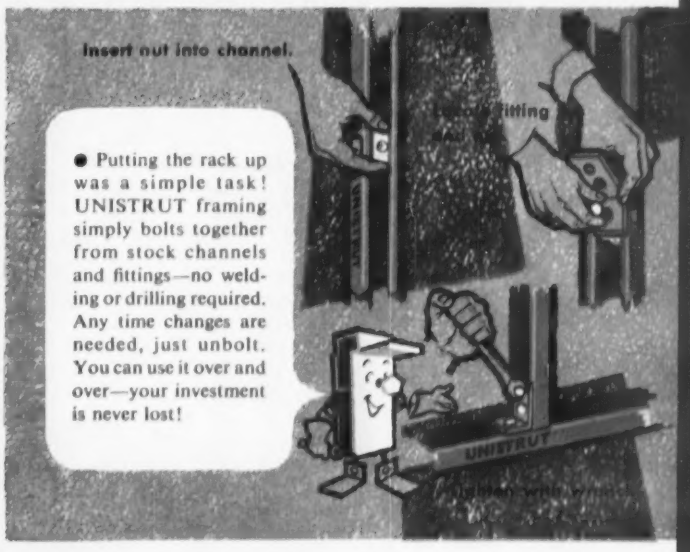
● This is the delivery ramp at a large Indianapolis department store warehouse. Items were stacked in zones according to address, then loaded. Look at that confusion! No wonder there was damage and mix-ups. This is when they called their UNISTRUT Distributor.



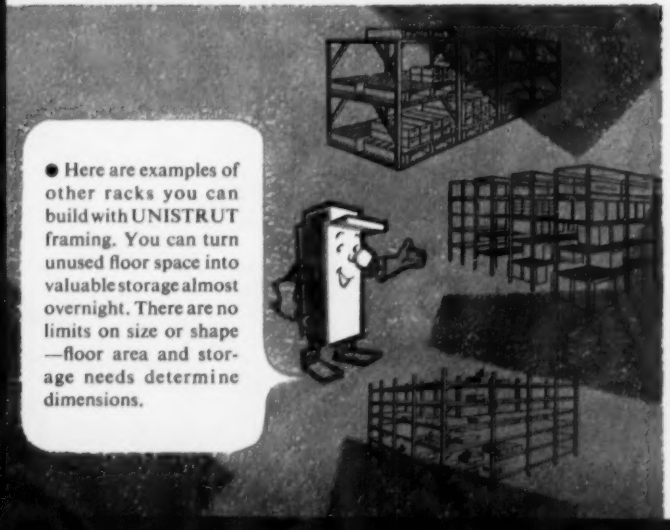
● The UNISTRUT Distributor surveyed the problem...studied traffic, aisle space, handling methods, etc. Then, with UNISTRUT metal framing he designed a rack to increase storage space, facilitate handling and reduce costly damage.



● And here's the result ...a cantilever rack with center support. Note the high middle section for tall items and wide shelf space. Storage was tripled because space was used from floor to ceiling. Handling is faster now with far less damage.



● Putting the rack up was a simple task! UNISTRUT framing simply bolts together from stock channels and fittings—no welding or drilling required. Any time changes are needed, just unbolt. You can use it over and over—your investment is never lost!



● Here are examples of other racks you can build with UNISTRUT framing. You can turn unused floor space into valuable storage almost overnight. There are no limits on size or shape —floor area and storage needs determine dimensions.

Whatever your storage needs, see your UNISTRUT Distributor or mail the coupon for free catalogs and UNISTRUT rack designs. Ask about the new low price of UNISTRUT framing. And be sure to see our latest film, "The Sky's The Limit"—at your UNISTRUT Distributor.

Remember, your UNISTRUT Distributor offers a complete service of design and engineering. He can help you in many ways to reduce costs and provide better storage facilities. Complete warehouse stocks in all principal cities. In Canada, Northern Electric Company.

The World's Most Flexible All-Purpose Metal Framing

U. S. Patent Numbers
2327587 2280379
2329815 2405631
2345650 2541908
2363382 2696139
Other patents pending

UNISTRUT PRODUCTS COMPANY
1013 W. Washington Blvd.
Chicago 7, Illinois
Dept. A-8

☐ 15 rack designs ☐ rack catalog No. 600
☐ Information on UNISTRUT film, "The Sky's The Limit."

Name.....
Address.....
Company.....
City.....Zone.....State.....

CM Lodestar®

ENTIRELY NEW
differently NEW

FLEXIBLE LINK CHAIN

PUSH-BUTTON CONTROL

FEATURING:

- Push Button Control
- Self-Adjusting Heavy Duty Brake
- Sealed-in Lifetime Lubrication
- Overload Protection
- Full Enclosed Components
- Lowest Headroom
- "CM-Alloy" Flexible Link Chain

CAPACITIES: from ¼ to 1 ton. Single and 3 phase. ½ ton model weighs only 51 pounds.

$149.50 and up

Built to serve you without costly maintenance

Lodestar is the first truly "heavy duty" version of the small electric hoist. The CM Lodestar is designed to operate without costly maintenance or interruptions in your work schedules. The initial cost is practically your only cost with a Lodestar... an extremely low cost indeed!

WRITE US or call your CM distributor for literature, prices and quick delivery from stock.

CHISHOLM-MOORE HOIST DIVISION
Columbus McKinnon Chain Corporation
Tonawanda, New York
REGIONAL OFFICES: NEW YORK • CHICAGO • CLEVELAND
In Canada: McKinnon Columbus Chain Limited, St. Catharines, Ontario

CM HOISTS AND CHAIN

Circle No. 6 on Reader Service Card for more information

AD LITERATURE

Continued

Hand Pushed . . . hoists and cranes should travel by power, says Detroit Hoist & Machine Co. The Trojan tractor is offered as the answer to quicker handling at reduced costs.

Circle 108 on Reader Service Card

Greater Product Protection . . . easier handling and stepped-up material flow, can be yours, says G. B. Lewis Company, if you'll consult them about containers.

Circle 188 on Reader Service Card

Obsolescence . . . is something you'll never have to worry about when you use Feedrail Corporation trolley busways, claims this manufacturer.

Circle 125 on Reader Service Card

The Bonus . . . in the bucket pays for the Michigan loader fast, says Clark Equipment Co. Capacity is strictly a matter of how much you can pick up in the bucket.

Circle 90 on Reader Service Card

To Save Money . . . on postal shipments in small packages The Mason Box Company suggests you consult with them. A colorful Mailmaster catalog is offered.

Circle 203 on Reader Service Card

Any Normal Load . . . can be handled at lower cost with its chainless conveyors, says Landahl Conveyor Co. The equipment is said to be easy to install or relocate, take minimum space and permit small-radius turns.

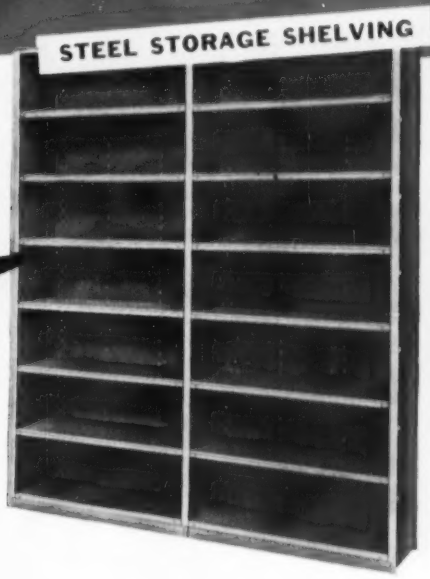
Circle 183 on Reader Service Card

You're Invited . . . to visit J. W. Greer Company's booth at the Material Handling Exposition in Chicago. There, says Greer, you'll see a palletizing machine load up to three or more times as many cartons as possible by manual methods.

Circle 148 on Reader Service Card

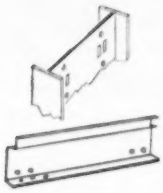
DESIGNED by DeLuxe FOR INDUSTRY

DeLuxe STEEL STORAGE SHELVING CUTS INSTALLATION EXPENSE 50% OVER ORDINARY SHELVING



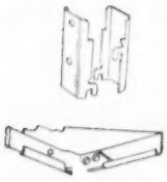
STEEL STORAGE SHELVING

A section of sturdy, easily-assembled DeLuxe shelving—closed or bin type.



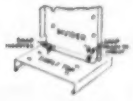
ONE-PIECE BIN TYPE UPRIGHT
- I-Beam construction for greater rigidity
- Faster erection—no panels to bolt

BOTTOM SHELF SUPPORT AND FLOOR ANGLE
- Distributes floor surface load evenly
- Permits shelving erection in vertical position—no stooping



BOLTLESS ADJUSTABLE SHELF BRACKETS
- Easy shelf adjustment—no tools needed
- 50% less nuts and bolts

FACTORY IMBEDDED - SHELF REINFORCING
1 x 3/16 high carbon steel bar built in and returned around end flanges where load is carried



SNAP-IN DIVIDERS
- Adds flexibility . . . dividers may be changed speedily to accommodate storage of new production parts

CLIP-ON BIN FRONTS
- No bolts to bother with
- Quick "clip-on" action

DeLuxe **BAR RACK**

Uprights bolted to cross-brace and footing. 13 gauge top ties are bolted to uprights as spreaders.

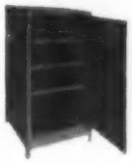
DeLuxe **STORAGE CABINETS**

Neat rounded corners. Louvered backs for ventilation. Shelves adjustable without tools.

DeLuxe **FOREMAN'S DESK**

Special rigid welded assembly for factory use. Adjustable to any floor surface.

DeLuxe **MACHINE STAND**



Welded shell of 22 gauge steel, three fixed 18 gauge shelves and 18 gauge top.

See our EXHIBIT at space 1972

DeLuxe

DELUXE METAL FURNITURE CO.
323 Struthers Street
WARREN, PENNSYLVANIA
A DIVISION OF ROYAL METAL MANUFACTURING CO.

Circle No. 104 on Reader Service Card for more information

when your cranes and hoists are powered by...

FEEDRAIL® Trolley Busways

PICTURED ABOVE

View of FEEDRAIL-powered bridge crane and hoist at receiving department in the plant of a leading automotive manufacturer. By means of a system of interlocking bridges, runways and monorails, materials can be transported to and from any point in the building—with FEEDRAIL's trolley outlets traveling right along, providing SAFE, uninterrupted power.

There are no time-consuming, costly traffic hold-ups when shipping and receiving department cranes and hoists are powered by FEEDRAIL Trolley Busways. FEEDRAIL's expertly engineered design makes it a completely safe, trouble-free system of electric power distribution.

What's more—it's *adaptable*—first, because practically any place a crane or hoist can go in receiving, production, staging and shipping areas, FEEDRAIL will go—and, second, because an installation can be readily modified or expanded to meet the needs of changing requirements.

GET the whole eye-opening story of FEEDRAIL Trolley Busways by writing for complete descriptive literature. Address Dept. F-5.

SOLD BY MORE THAN 1,000 ELECTRICAL DISTRIBUTORS FROM COAST TO COAST

CH4-1

ELECTRIC FEEDRAIL

Never Becomes Obsolete

FEEDRAIL CORPORATION

Subsidiary of Russell & Stoll Company, Inc.

125 BARCLAY STREET • NEW YORK 7, N. Y.

SPECIALLY QUALIFIED REPRESENTATIVES IN PRINCIPAL CITIES

Circle No. 125 on Reader Service Card for more information

AD LITERATURE

Continued

Heavy-Handling . . . around the clock for 15 years is the record of nine Whiting cranes in use by a leading manufacturer of mechanical presses. This story of service is told by Whiting Corporation.

Circle 293 on Reader Service Card

Completely Sealed Casters . . . are featured by Albion Industries, Inc. The need for periodic maintenance is eliminated in the new casters which incorporate precision moulded Synthi-Rubber ring gaskets around the load raceways and the wheel axle ends.

Circle 22 on Reader Service Card

Dependability . . . of Elpar trucks pays off at Packard Motor Co. The car manufacturer has an automatic production line, and split second delivery of material is a must, as is fast removal of completed units. Elwell-Parker Electric Company tells the story.

Circle 117 on Reader Service Card

Production and Storage . . . costs will be cut if you use the Stak-Pal system of material handling, according to C. E. Robinson Co.

Circle 250 on Reader Service Card

One Millionth of a Second . . . is all the time Gould-National Batteries, Inc. needs to measure voltage readings. An Oscillograph does the work which helps to give you greater battery dependability.

Circle 147 on Reader Service Card

You Should Insist . . . upon a one year warranty when you buy an electric fork truck, suggests Baker-Raulang Company. That way, says Baker you'll be assured of the manufacturer's complete confidence in the materials and workmanship that go into his product.

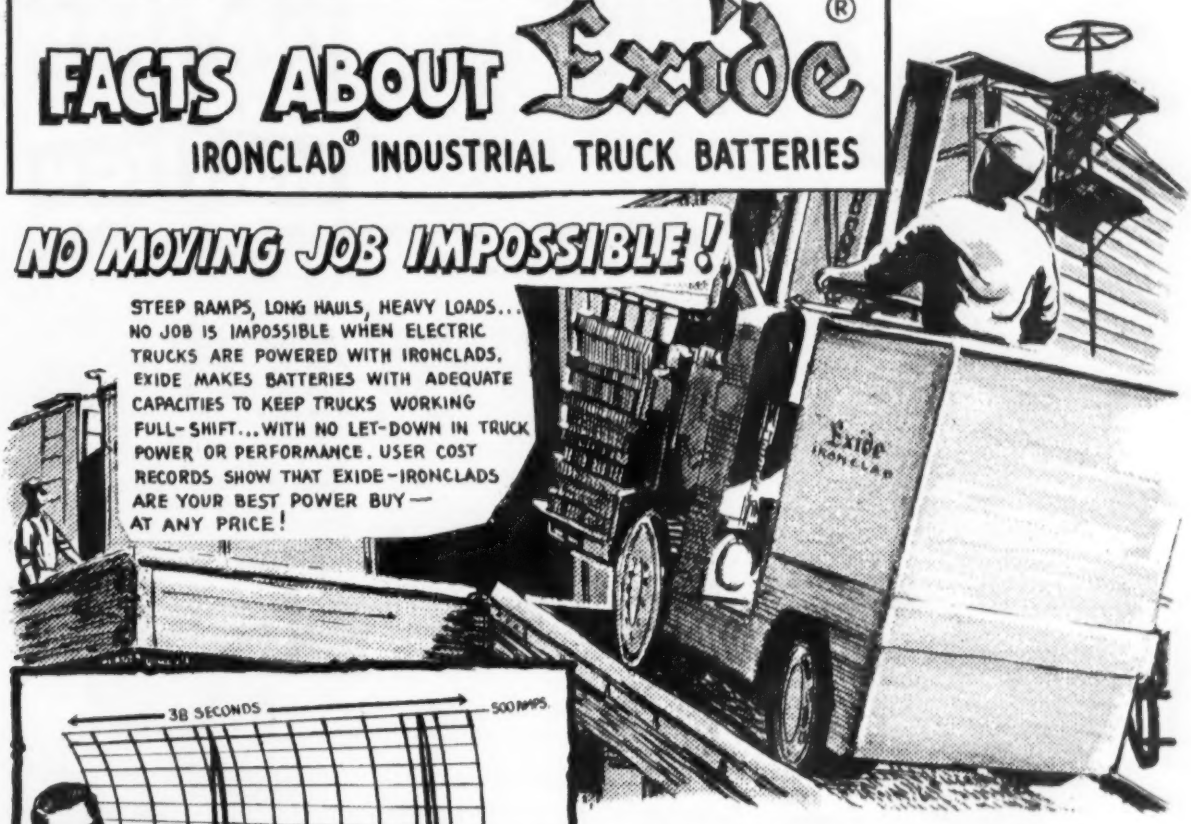
Circle 59 on Reader Service Card

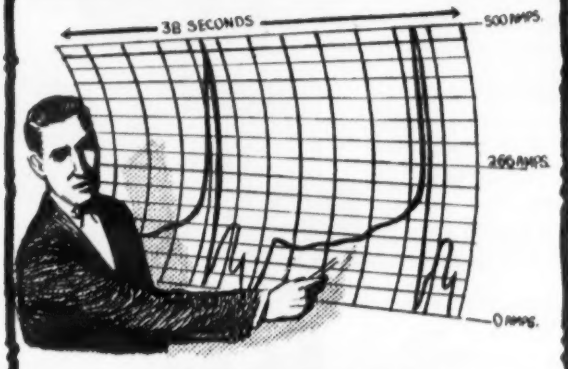
FACTS ABOUT Exide®

IRONCLAD® INDUSTRIAL TRUCK BATTERIES

NO MOVING JOB IMPOSSIBLE!

STEEP RAMPS, LONG HAULS, HEAVY LOADS... NO JOB IS IMPOSSIBLE WHEN ELECTRIC TRUCKS ARE POWERED WITH IRONCLADS. EXIDE MAKES BATTERIES WITH ADEQUATE CAPACITIES TO KEEP TRUCKS WORKING FULL-SHIFT...WITH NO LET-DOWN IN TRUCK POWER OR PERFORMANCE. USER COST RECORDS SHOW THAT EXIDE-IRONCLADS ARE YOUR BEST POWER BUY— AT ANY PRICE!



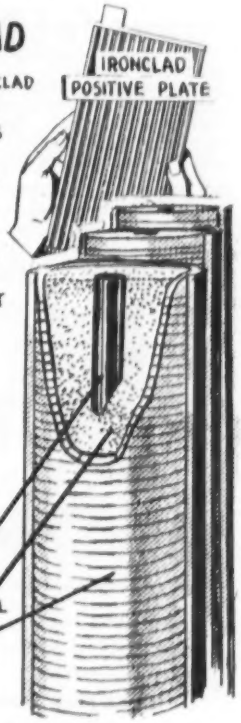


PORTRAIT OF AN EXIDE WORKING

IN JUST TWO MOVES AND 38 SECONDS A FORK TRUCK MAY DRAW ENERGY FROM ITS BATTERY IN THIS PATTERN, IN RESPONSE TO 44 SEPARATE CONTROLLER OPERATIONS. IN AN 8-HOUR SHIFT, 3000 SUCH DEMANDS MAY BE MADE. EXIDE-IRONCLADS ASSURE RAPID, ACCURATE HANDLING OF MATERIAL... THEY RESPOND INSTANTLY TO THESE RAPIDLY RECURRING DEMANDS FOR HIGH POWER FOR SHORT DURATIONS.

TUBES OF POWER WORK FOR YOU INSIDE AN IRONCLAD

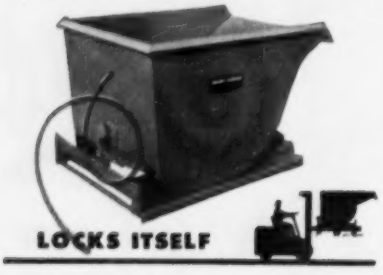
SLOTTED TUBES INSIDE AN IRONCLAD KEEP ACTIVE MATERIAL IN FIRM CONTACT WITH CONDUCTING GRIDS OF THE POSITIVE PLATE...THIS GRID PROTECTION LENGHTENS THE LIFE OF THE BATTERY. SLOTTED TUBES EXPOSE MORE ACTIVE MATERIAL TO THE ELECTROLYTE... FOR GREATER POWER. FINE TUBE SLOTS HOLD MATERIAL IN CONTACT WITH GRID LONGER...RESULT, THE IRONCLAD'S ABILITY TO DO YOUR MATERIALS MOVING JOB FOR A LONGER PERIOD OF TIME. THAT IS WHY EXIDE-IRONCLADS ARE YOUR BEST INDUSTRIAL TRUCK BATTERY BUY— AT ANY PRICE!



LET EXIDE HELP SOLVE YOUR INDUSTRIAL TRUCK BATTERY PROBLEMS. ❶ CALL AN EXIDE SALES ENGINEER FOR FULL DETAILS. ❷ WRITE FOR FORM 1982, A MANUAL ON INSTALLING AND MAINTAINING MOTIVE POWER BATTERIES.

Exide INDUSTRIAL DIVISION, The Electric Storage Battery Company, Philadelphia 2, Pa.

Circle No. 116 on Reader Service Card for more information



pays for itself!

It's the safe, sensible, economical way to handle wet or dry, hot or cold bulky materials. Simple, one-man operation does the job with amazing speed . . . *cuts cost of hand unloading by at least 50%.*

This rugged Roura Self-Dumping Hopper is built to withstand the terrific knocks and bangs of rough usage. Extra heavy gauge metal and welded construction mean years of dependable service. Fits any standard fork or platform lift truck. Also available mounted on live skids or with malleable or rubber tired casters. Sizes from ½ to 2 cubic yards. Thousands in use in America's biggest industries.

ROURA
Self-Dumping
HOPPER

WANT MORE FACTS? Clip this coupon . . . attach to your letterhead . . . sign your name . . . and mail to . . .

ROURA IRON WORKS, INC.
1411 Woodland Ave., Detroit 11, Michigan

Circle No. 256 on Reader Service Card

AD LITERATURE

Continued

No Operator's Required . . . to guide Barrett-Cravens Company's new Guide-O-Matic tractor. The truck's completely automatic; moves along predetermined routes at any desired speed.

Circle 64 on Reader Service Card

Fast Addressing . . . at low cost, can be yours, according to Sten-C-Labl, Inc., through use of its direct-to-carton addressing system. Details are offered.

Circle 266 on Reader Service Card

The 50th Anniversary . . . is noted by Bond Foundry & Machine Co., who claims your best buy in material handling equipment for 50 years has been Bond equipment.

Circle 71 on Reader Service Card

Outstanding Features . . . of Buschman roller conveyors are pointed out by The E. W. Buschman Company. The conveyors are said to be better built.

Circle 79 on Reader Service Card

You Benefit . . . if you use Revolvator Go-Getter lift trucks, says Revolvator Co. The manufacturer has more than 50 years of diversified experience to back up its equipment.

Circle 246 on Reader Service Card

Want To Cut Costs . . . increase production? Catalog offered by Cyclone Fence Department, American Steel & Wire Division, gives cost-saving facts on efficient process operations.

Circle 42 on Reader Service Card

Time . . . busy and idle, is recorded by the Servis Recorder, product of The Service Recorder Co. The units were originated in 1911, and may be installed on fork trucks and other industrial equipment.

Circle 15 on Reader Service Card

LOW COST mobility
with the
MULTITON
EXCELSIOR
LIGHTWEIGHT
Motor Truck

• 1500 lbs pay load • only 366 lbs total weight • unmatched economy in purchase, maintenance and operation • unprecedented maneuverability • turns completely in its own length • 2½ HP Briggs & Stratton industrial engine 3-speed transmission both forwards and backwards • low loading platform for safety and easy loading • powerful hand & foot brakes

See these trucks at the 6th National Materials Handling Exposition-Chicago Booth - 1947 May 16-20th.

3 models from **$505** FOB Pt. Washington, N.Y.

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STOKVIS ⊙ EDERA & CO. INC.
18 Secatoag Ave., Dept. T-2 Pt. Washington, N.Y.

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proven material handling power

with TORQUE CONVERTER DRIVES

6 PAYLOADER TRACTOR SHOVELS

FRONT WHEEL DRIVE

MODEL HA—Completely new model—twice the digging, carrying and lifting capacity. Exclusive 40 degree bucket break-out at ground level. Digs, carries, dumps and spreads bulk materials—indoors and outdoors. Unloads box cars of bulk materials. 18 cu. ft. bucket capacity.

MODEL HAH—a larger front-wheel-drive model with 24 cu. ft. bucket capacity. Large, 12"00 x 24 inch pneumatic tires on drive wheels give tremendous traction on or off pavement. Rear-wheel power steer insures easy operation and fast maneuvering in close-quarters.

REAR WHEEL DRIVE

MODEL HFC—This "PAYLOADER" with 1 cu. yd. bucket capacity is a popular, well-proven model especially for outdoor use. Rear-wheel-drive enables it to dig and grade as well as load trucks, carry and stockpile. Travel speeds up to 19 m.p.h.

MODEL HFHC—This extra high-lift "PAYLOADER" can dump its loads over bin edges up to 11½ feet high. Especially popular for loading and handling coal and other light materials into high trucks and wherever high lift and long reach are desirable.

FOUR WHEEL DRIVE

MODEL HM—This pioneer 4-wheel-drive tractor-shovel with 2 cu. yd. bucket is the largest in the "PAYLOADER" line, with an enviable reputation in construction, raw materials and manufacturing industries. Rear-wheel power-steer makes it maneuverable and easy to handle.

MODEL HR—Provides the many advantages of 4-wheel-drive in a smaller machine. This 1 1/3 cu. yd. machine has proven as popular as the bigger HM and has the same features, including 4 speeds both forward and reverse and rear wheel power steer.

3 PAYLOADER TRACTORS

MODEL TM — A big, 4-wheel-drive tractor with 15,000 lbs. drawbar pull. Has effective traction to work on pavement, snow, sand and mud. Used for switching and spotting cars—walks easily across tracks. Can be equipped with railroad couplers, air brake control, etc.

MODEL TU-90 — Another 4-wheel-drive tractor with power steer. Pushes or pulls in either direction. Only 5 feet high; 12 feet long. Will handle large aircraft easily — has 9,000 lbs. drawbar pull.

MODEL TC-60 — A powerful, compact tractor with 6,000 lbs. drawbar pull, yet less than 10 feet long. Rear wheel drive on dual tires; front-wheel power-steer; speeds up to 17 mph.

Full-reversing transmissions plus torque converter drive feature all these famous "PAYLOADER" tractor-shovels and tractors — give them maneuvering speed, ease of control and a wide choice of operating ranges.

Each "PAYLOADER" is a proven unit, made by the tractor-shovel pioneer that has built more wheeled tractor-shovels than all others combined. And "PAYLOADER" units are sold by an experienced, well-established Distributor organization having complete parts and service facilities that protect your "PAYLOADER" investment.

N.M.H.E. Show
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SAY "HUFF"

PAYLOADER®

MANUFACTURED BY
THE FRANK G. HOUGH CO. • LIBERTYVILLE, ILL.
SUBSIDIARY—INTERNATIONAL HARVESTER COMPANY

The Frank G. Hough Co.
731 Sunnyside Ave., Libertyville, Ill.

Please send information on the complete line of "PAYLOADER" tractor-shovels and tractors.

Name _____

Title _____

Company _____

Street _____

City _____

State _____

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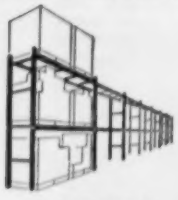
"Stack up" with American STORAGE RACKS

AN EXCLUSIVE AMERICAN FEATURE

....Cut your Handling and Warehousing Cost

When you "stack up" with American Tubular Storage Racks, you also "stack up" savings. The ingenious and simplified American feature, "erected without bolting or welding," has made them first choice with many businesses both large and small. American Racks are designed to meet practically every storage need. Send for catalog and get the facts on American before you buy any type of rack.

send for catalog



Standard Pallet Racks

Adjustable Pallet Racks

Skid Racks

Warehouse installation STD. TUBULAR PALLET RACK, Hancock-Nelson Mercantile Co., St. Paul, Minn.

Tool & Die Racks

Drum & Barrel Racks

Coil Racks & Tiering Racks

AMERICAN METAL PRODUCTS CO.

STORAGE RACK DIVISION

5959 Linsdale • Detroit 4, Michigan

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AD LITERATURE

Continued

Protect Your Production . . . with Marietta concrete industrial storage silos, says The Marietta Concrete Corp. The silos can be tailored to your specific needs.

Circle 232 on Reader Service Card

An Acre . . . of "brickbats" can be swept in two hours with its power sweeper, says G. H. Tennant Co. Find out how one manufacturer saved thousands of dollars through use of sweepers.

Circle 275 on Reader Service Card

From Raw Materials . . . to finished product, Jervis B. Webb Co. conveyors speed production and reduce costs at a large paper mill. Details are given on the entire operation.

Circle 290 on Reader Service Card

Proof . . . that Nestier small parts handling systems save you money is offered by The Chas. Wm. Doepke Mfg. Co., Inc.

Circle 111 on Reader Service Card

User Reports Prove . . . that electric trucks save you money, says Lewis-Shepard Products, Inc. They offer details.

Circle 189 on Reader Service Card

The Best Control . . . of lift truck power is claimed by Hyster Company. Called Hystamatic drive, the feature is said to offer "hair-line inching control" for stacking, carloading and close-quarter operation.

Circle 164 on Reader Service Card

Magnetic Handling . . . of high-density loads is discussed by The Ohio Electric Mfg. Co.

Circle 226 on Reader Service Card

Bulk Discharge Methods . . . are pictured and described by Baughman Manufacturing Co., Inc.

Circle 65 on Reader Service Card

Yale trucks speed merchandise handling for General Warehouse & Transportation Co., Chicago and Rockford, Ill.

16 Yale trucks handle 130,000,000 lbs. per year for large Chicago warehouse

General Warehouse & Transportation Co. in Chicago puts its fleet of sixteen YALE Gas Fork Lift Trucks on heavy-duty schedules. Last year, for example, these YALE trucks worked two shifts a day to handle pallet loads of merchandise totaling 130,000,000 lbs.—an average of 8,125,000 lbs. per truck.

The complete YALE line of Gas, Electric and Diesel Trucks and use-extending attachments solves handling problems of warehousing and shipping operations of any size. Harder-working, longer-lasting YALE equipment helps meet delivery schedules...allows you to systematize the movement of materials into storage, out of storage to loading platforms, and into delivery trucks and railroad cars. For details about the YALE trucks that will do the best job for you, send coupon today.

YALE* **INDUSTRIAL LIFT TRUCKS AND HOISTS**

*Reg. U. S. Pat. Off.

Gas, Electric, Diesel & LP-Gas Industrial Trucks • Worksavers Warehousers • Hand Trucks • Hand & Electric Hoists

MAIL THIS COUPON TODAY

The YALE & TOWNE Manufacturing Co., Dept. 45
Roosevelt Boulevard, Philadelphia 15, Penna.

Please send me detailed information about YALE
☐ Gas Trucks ☐ Electric Trucks ☐ Worksavers & Warehousers
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Company_____

Name_____ Title_____

Street_____ City_____ State_____

In Canada write: The Yale & Towne Manufacturing Co. St. Catharines, Ontario, Canada

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AD LITERATURE

Continued

Good Rule . . . to follow when buying any specialized machine, says Continental Motors Corporation, is to choose a make whose builder thinks enough of his own good name to equip his product with a Continental motor.

Circle 98 on Reader Service Card

Handling Coil Stock? . . . Then Cullen-Friestedt Co. invites you to check the advantages of its C-F Lifter.

Circle 101 on Reader Service Card

Stepped Up Production . . . in the shipping room will be noted immediately if you'll use Tape-Strap for reinforcement, according to Mid-States Gummed Paper Company.

Circle 209 on Reader Service Card

Entirely New . . . is what Chisholm-Moore Hoist Division has to say about the Lodestar, a heavy duty version of the small electric hoist.

Circle 6 on Reader Service Card

Traffic Jams . . . need not occur at your loading docks, says The Wayne Pump Company. They offer a way to speed loading, increase shipments and prevent accidents.

Circle 289 on Reader Service Card

Prize-Winning Packs . . . are shown by The Celotex Corporation. The packs show how you can cut packaging costs.

Circle 84 on Reader Service Card

Hang It Up . . . and save, challenges Manning, Maxwell & Moore, Inc. They're speaking of the Budgit aluminum chain block for on-the-spot hoisting.

Circle 198 on Reader Service Card

Taped Boxes . . . are best, says American Sisalkraft Corp. They'd like to tell you why.

Circle 13 on Reader Service Card

Everything Is New . . . on the Bantam Ready-Power gas-electric power unit, according to The Ready-Power Company. A trial offer is made by the manufacturer.

Circle 8 on Reader Service Card

Up Go Profits . . . down go costs with modern fork trucks powered and protected by Chrysler power partners, says Chrysler Corporation.

Circle 7 on Reader Service Card

All-purpose, light-duty truck. Side rails extend 1¾" above cross-bars to take kegs & barrels. Available with folding extension nose. The *Daisy* is only one of more than 50 different models for every job.

American Barrel Cradles

All steel construction. Patented, disappearing loading bar. Shipped semi-knocked-down in cartons to save warehouse space, keep cradles in top condition.

American Steelite® Wheels

Light weight, pressed-steel centers. Special design ball bearings make wheels interchangeable—fit any axle or hub. Heavy-duty rubber treads "rolled on so they can't roll off".

American Appliance Trucks

Strong, light weight magnesium construction. Adjustable side rails. Heavy web straps with self-locking buckles. Rubber-padded contact surfaces. Endless-belt stair climber. Special types for all kinds of appliances.

Whatever you move...

AMERICAN

will move it faster and at lower cost

There's an American Hand Truck to move *every* type of merchandise . . . for every type of use. Over 50 different models and sizes, each custom-designed to do a specific moving job.

The American steel hand truck line is rugged. Die-formed, pressed-steel side rails, cross-bars and braces give maximum strength with minimum weight for easy handling. All joints and surfaces are satin-smooth to protect loads. Finger-tip balance makes moving loads easier, adds maneuverability. American Steelite ball-bearing wheels are *standard equipment* on every truck, for years of extra free-rolling wear.

No matter what you move there is an American Hand Truck to do the job for you. See your local distributor or write today for a free catalog on the American Hand Truck Line. The American Pulley Company, 4290 Wissahickon Ave., Philadelphia 29, Pa.

AMERICAN HAND TRUCK HEADQUARTERS

5-year GUARANTEE

Stocked and sold nationally by over 350 distributors

Materials Handling by

AMERICAN

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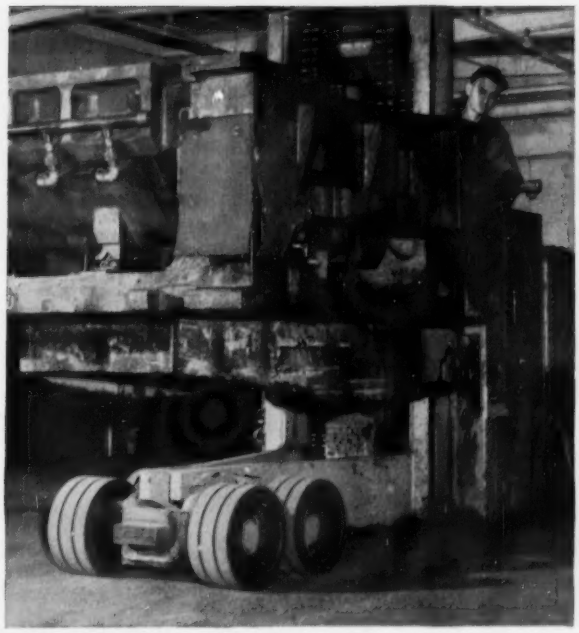
You can get any of this Valuable Literature Immediately

Use the Convenient Reader Service Card Bound in this Issue.

B.F.Goodrich

TW ANALYSIS lengthens tire service, cuts costs for Willys Motors



Major Mechanic Harold Roberts operates a lift truck carrying a 7-ton Willys door die to the press.

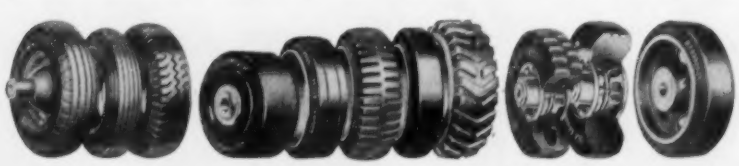
This Willys truck motor heads for the shipping department, driver James Boltz at the wheel. Willys uses nearly 10,000 industrial tires.

OVER 2,000 materials handling units carry dies, motors, parts and the like throughout the vast Willys Motors plant in Toledo, Ohio. Oil and grease attack the industrial tires, railroad tracks bruise them, steel shavings tear at them. Virtually every existing threat to tire life can be found in the Willys complex materials handling set-up.

That's why the company turned to the B. F. Goodrich Tire and Wheel Analysis man. He studied Willys' operations, recommended the right tire types, sizes, tread designs and tread compounds for each of their varied jobs. The result, says Major Mechanic Harold Roberts, is that "these industrial tires give us far longer, trouble-free service—and this saves us money."

Find out how the FREE TW Analysis can save you money

No matter what your materials handling problems are, you can benefit from a FREE B. F. Goodrich Tire and Wheel Analysis. Just call your local B. F. Goodrich retailer or mail the coupon. The TW man will survey your equipment, loads and hauling surfaces. The tire and maintenance recommendations he makes will be *unbiased*, because B. F. Goodrich makes a *complete* line of industrial tires. Act now—let your B. F. Goodrich man show you how to start saving. He may cut your tire costs as much as 50%. A special TW Analysis Plan is available for manufacturers of industrial equipment.



Specify B. F. Goodrich tires when ordering new equipment

The B. F. Goodrich Company
Tire & Equipment Division
Department TW-500, Akron 18, Ohio

Please send me:

- ☐ Additional information on your Tire and Wheel Analysis Plan
- ☐ Free copy of "Industrial Tire Guidebook"
- ☐ Free copy of "How to Get Extra Service out of Solid Industrial Tires"

Name_____

Company_____

Street_____

City_____ Zone____ State_____

Circle No. 144 on Reader Service Card for more information

Here's a ONE-MAN system

for scrap collection—

The Ross Straddle-Dump loads, delivers, DUMPS!

Here's the hottest development in the waste trade industry . . . STRADDLE DUMP! Now with one machine, you pick up scrap boxes at your customer's yard, transport them back to your yard at truck speeds, DUMP THEM IMMEDIATELY!

It's a one-man collection system! The Ross Carrier is self-loading, self-unloading, and now, with STRADDLE DUMP . . . self-dumping too. It means a faster collection system—large savings in money and manpower.

Here's more—You can save money by fabricating your own scrap boxes . . . operate efficiently with fewer containers, yet handle larger scrap capacities *in segregated loads.*

It's too good to pass up . . . write for full details today!

Carrier operation at Central Iron and Metal Co., Battle Creek, Michigan. Central Iron found one Carrier replaced three trucks; now requires one operator instead of three.

STRADDLE DUMP in action at the Phillip Greenberg and Co. scrap yard, St. Paul, Minn. Instrumental in the development of the front-end hook arrangement of STRADDLE DUMP, the Greenberg Co. worked with Clark engineers in field testing work. Mr. Greenberg reports: "Our Carrier has replaced 6 trucks . . . its uses are unlimited. The Carrier can be adapted to the hauling of structural steel, rubbish removal, sand delivery, cinder and ash removal, and, of course, it can't be beat for scrap hauling. We make our own gondolas—in the size and shape required. Saves us a lot of money—gives greater customer satisfaction."

CLARK EQUIPMENT

ROSS CARRIER DIVISION
CLARK EQUIPMENT COMPANY
Benton Harbor 13, Michigan

A BETTER BUY WITH LOCAL SUPPLY—GENUINE CLARK PARTS

Circle No. 91 on Reader Service Card for more information

a TURN for the better...

ANCHOR Automatic transfer "around the corner" or "from line to line", makes possible uninterrupted assembly operation, manpower savings and greater efficiency.

Another ANCHOR "First" in automation achievement.

ANCHOR automation can cut cost in any industry.

LEFT: *180° turn automatically transferring between two parallel Flat Top assembly conveyors.*

LOWER LEFT: *Automatic right angle conveyor between two assembly conveyors.*

BELOW: *Continuous pallet type production or transportation conveyor which can incorporate turns in either direction.*

ANCHOR STEEL AND CONVEYOR COMPANY

DESIGNERS AND MANUFACTURERS

6906 KINGSLEY AVENUE • DEARBORN, MICHIGAN

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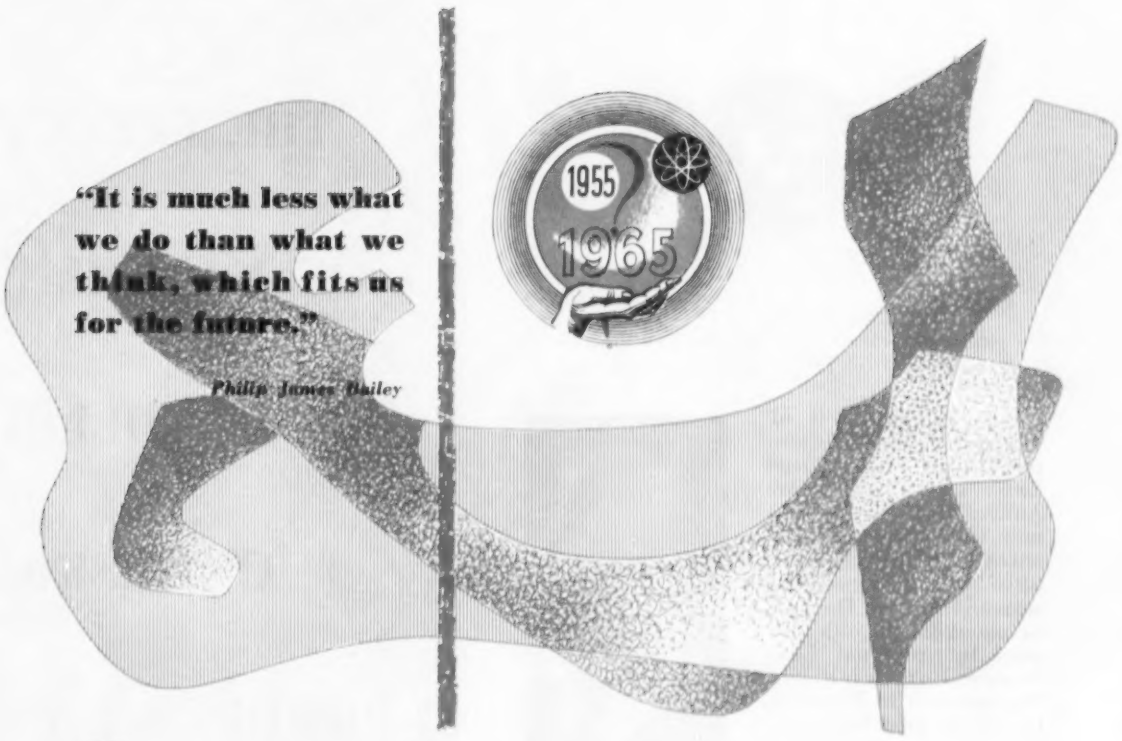


CONTROLLED MECHANIZATION of material handling has excited the imagination of everyone. With this new era of technology almost upon us, it has seemed to FLOW that a special issue should note the irresistible trends in industry that will soon affect all businesses, all people.

Not every concept offered in this issue will materialize. But each one reveals the deep, intelligent, progressive thinking that is being done by industrial and economic leaders. We feel that their views and ideas will stimulate other imaginations, arouse discussion and, perhaps, create healthful controversies.

THE EDITORS

THE EFFECT OF MATERIAL HANDLING ON RISING PRODUCTIVITY IN THE NEXT TEN YEARS

By V. Donald Schoeller and Adrian M. McDonough, Wharton School of Finance & Commerce, University of Pennsylvania.

PROF. SCHOELLER of Wharton School is Director, Taylor Management Laboratory; Director, Annual Wharton Summer Refresher Conference; and Project Director, Management Research Projects. He participated in the 9th Annual International Conference For Scientific Management in Brussels, In 1951, and has conducted top management conferences in six countries.

MR. McDONOUGH was with General Electric Company for eight years, working in design and production engineering. During War II, he was assigned to the Naval Office of Research and Invention. In 1947-48, he was appointed Alfred P. Sloan Fellow in Economic Research at American University, Washington, D. C. He began teaching at Wharton in 1949.

PART I

The Role of Planning

THIS ISSUE OF FLOW is a testimonial to the importance of the conscious generation of progress in the United States of America.

The number one problem that any organization has to face is that concerning forecasting. How will the future treat it? What must it do now to meet coming events? How can it best exploit changes that are to its advantage? And how can it minimize changes that are to its disadvantage?

It is only through evaluation of the future that we can guide our actions today. Therefore, an important segment of our economy is concerned with planning. Planning is done by the many rather than by the centralized few. Thus, we have democracy in action with the law of large numbers working to benefit the system. Each individual and each organization shares in the satisfaction as better planning leads to greater accomplishment.

The United States has thrived on a spirit of progress. An atmosphere of constant improvement has created growing opportunities and increased satisfaction for all. Each day we expect the new and, through our desires, we sustain our progress. Our strength is a healthy curiosity to see what can be done. In our economy it has paid to be curious. The record shows that where there has been motivation there will be progress. Various studies of national productivity have led to the conclusion that the basic requirement for economic development is a receptive social and economic environment. A positive attitude is both our heritage and a promise for our future.

President Eisenhower made the following statement in his Economic Report of the President, in January, 1955:

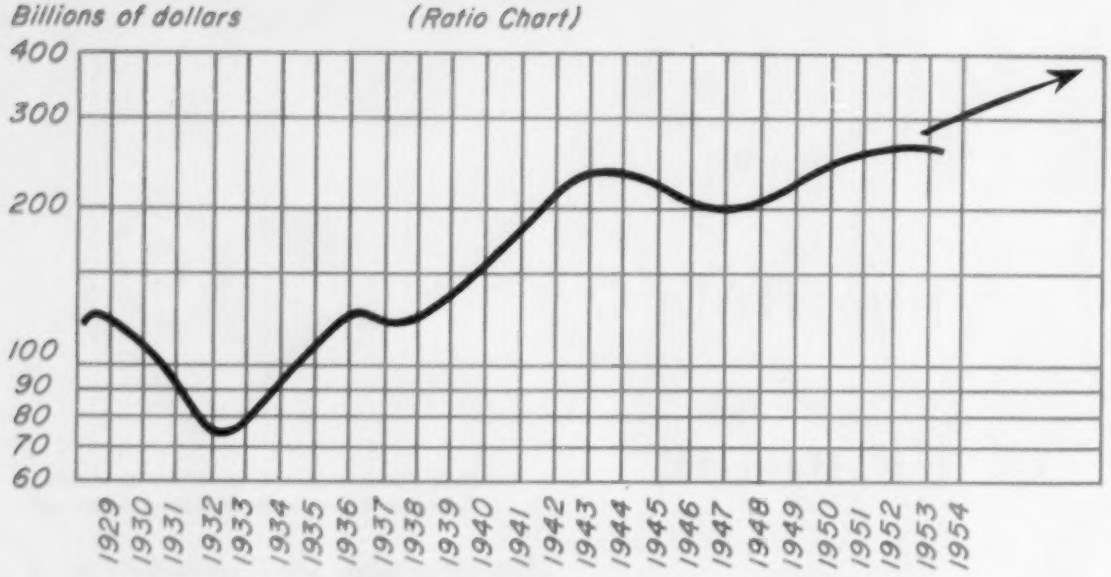
> "Many factors favor a continuation of our vigorous economic growth. The population is increasing rapidly, educational levels are rising, work skills are improving, incomes are widely distributed, consumers are eager to better their living standards, businessmen are starting new enterprises and expanding old ones, the tools of industry are multiplying and improving, research and technology are opening up new opportunities, and our public policies generally encourage enterprise and innovation."

It would appear that this country, in the aggregate, is planning for a fairly radical surge in its national productivity. The evidence for such a conclusion is the growing interest on the part of companies, professional organizations, and government groups in broad research directed towards establishing overall goals and specific programs for implementation. This trend is a continuation of a post-war emphasis on new construction, improvement of production methods, and more intensive management stress on advanced analysis.

Management is taking a view which blends the use of both intuitive judgment and analytical science. It is digging for facts and relationships. It has realized that, although we live in a world seen in three dimensions, most of our problems have many more variables. New techniques are being developed to handle problems which are affected by large numbers of factors. Operations Research is coming out of incubation in the "ivory-tower" and is receiving substance as a budgeted item in many organizations. This new attitude and methodology of defining and solving management problems opens up new frontiers—new opportunities for progress.

Analysis of multifarious problems has created a need for new mathematical and computational tools. Examples are research in Theory of Games, Linear Programming and the development of electronic computers. We are constantly trying to measure that which was previously considered unmeasurable.

(More on next page)



National Income at Constant (1947) Prices — 1929-1954
Source: National Income, 1954, U. S. Dept. of Commerce, Office of Business Economics

BY 1965 the level of National Production and Consumption will have increased over today's by some twenty-five to thirty percent.

Rome fell when it decided that it had solved all its problems. We will have no such worry as long as we find new challenges. The spirit of inquiry which is developing underwrites our future.

The subject of this article requires answers to two questions: (1) How will productivity rise in the next ten years; and (2) What contributions will the field of material handling make to increasing productivity?

Before these questions can be answered, the terms "productivity" and "material handling" must be defined. To be consistent we should recognize that both are, in themselves, abstractions—useful ways of looking at complicated units.

Productivity is defined by the Bureau of Labor Statistics as: "A 'yardstick' of the long-run progress made by industry in reducing the amount of human effort needed to produce the various goods and services used in our economy. Productivity is expressed as output-per-manhour and can be influenced by many variables, e.g.:

1. Technological improvements
2. Rate of operation
3. Relative contribution to output of plants at different levels of efficiency
4. Availability of supplies and the flow of materials and components
5. Skill and effort of the work force
6. Efficiency of management
7. State of labor relations

To predict what will happen to productivity in the next ten years requires that the most significant of the influencing factors be evaluated. The limitations are apparent. We must be satisfied to delimit our analysis to those factors which have some degree of measurability—and then to adjust the results by intuitive judgments relative to the no less important qualitative factors.

In the following sections the statistics on National Income are divided by sizes of the working population to obtain the general measure of productivity, i.e., output-per-manhour. The ratio of output-per-manhour is useful as long as we recognize that man's skills and efforts *plus* many other factors influence output. A further qualification is that increased productivity can be consumed in any one (or a combination) of three ways—shorter hours, improved quality, or greater quantity.

Measuring National Well-Being

The best available statistical measure of well-being in our economy is National Income. It measures the net factor costs of goods and services produced in a given year. If we know the number of manhours associated with the production of these goods and services, we can set up productivity ratios and, with proper cautions, compare changes over the years. Note that this approach in general delimits the measure to only those items which appear in the market. Services of housewives, for example, are not included. For the measure to be accepted we must assume that excluded items tend to remain constant and that we, therefore, are working with the significant variables. Hence, despite its limitations, the measure of National Income

[1] *Potential Economic Growth of the United States in the Next Decade, Joint Congressional Committee on the Economic Report.*

[2] *Data in this section is from National Income,* 1954, *United States Department of Commerce, Office of Business Economics. National Income at constant prices has been approximated by using implicit price deflators—page* 216*—Table* 41.

is useful for measuring progress of an economy.

Detailed studies considering the potential of our economy[1], have been made but for our purposes a chart showing National Income is sufficient. It tells us that we have been increasing our national income (a reflection of material output) at a rate of 3 percent per year[2] on an ever-increasing base. Since 1929 the figure has gone from $125 billion to $248 billion (1947 dollars.)

The working part of our population has increased from 46 million to 64 million. Thus, National Income per worker rose from $2717 to $3877. The average of hours worked per year in 1929 was 2200. By 1954 the figure was down to 1960. (Leisure time has increased by 5 hours per week.)

By taking the above data into comparative ratios, we see that output per manhour has increased from $1.23 in 1929 to $1.97 in 1954. In constant (1947) dollars this means that an hour of work today results in purchasing power of more than one and one-half times what it was in 1929. More importantly, real income has been raised to a point where the necessities can be purchased and markets created for those extras which go to make up the rising standard of living.

Projection of the above trend through the next ten years would give a productivity figure of $2.65—or an extension above today's level of production and consumption by some 25 to 30 per cent. The increase in productivity, added to our present position, can provide us with the means to carry out programs in our economy which today are only wishful thinking.

PART II

Technological Surges and the Spirit of Capitalism

THE INDUSTRIAL REVOLUTION, starting in the 16th Century, was a period when pieces of the picture began to go together. Many components not valuable in themselves had to be developed before an integration into a useful technique was possible. Initial successes generated further efforts. The spirit of capitalism, or enterprise, encouraged individuals to work hard to come up with answers to economic and technical problems.

It would appear that there are good possibilities that we will see changes that will justify the labeling of the next ten years as the start of a real "Second Industrial Revolution." We will see not only more effective production of present goods and services but—perhaps more importantly—also many newly created goods and services.

The economic trends of the past and the activities of the present are reinforced by the international situation. Every American realizes, if only subconsciously, that we must advance and share our gains if our system is to withstand the onslaught of creeping communism. In effect, we cannot afford to stand still. We must produce not only to raise standards of living but also to keep ourselves and the world free to make moral choices as expressed through the common denominator of all religions—the Golden Rule (in itself a credo for democracy.) There must be moral strength to reinforce our physical and intellectual progress.

With each advance of our economy, there are possible new products that were precluded before because of limits in the methods of production. For example

(More on next page)

the automobile engine could not be economically machined and assembled by a craftsman at a workbench, and only the simplest items could be produced at a price attractive to the many. Thus, as we have moved towards purer flow in manufacturing, we have brought new products within the limits of economic production.

The writers feel that this is part of the answer to those who have claimed "we have no production problems; we have only distribution (sharing) problems." It appears that the solution to the problem of distribution is to create new areas for production—new products, new services—so that there is a constantly growing basket of marketable goods. This way we are all "Kings", riding in our chariots and turning the knobs to call forth the "court jesters."

An assumption of progress at least reduces the problem of distribution by moving us further and further above the subsistence level. Above this level greater attention can be paid to operating the system so that incentives work to perpetuate the cycle. This view accepts a degree of difference in standards of living as a necessary part of the motivating force.

Material Handling and Its Scope

Historians have recorded how transportation has played a key role in the advance of civilization. The conquering of world space has been one of the greatest challenges to man. The inventions of the wheel, the sail, the steam engine and the airplane were all contributions to solving the problems of getting something, somewhere, safer and faster.

Today, the transportation networks of the world bulge with activities creating time and place utility. In the United States the arteries for the flow of goods and services are constantly being developed and improved. Economic analysis of plant location is developing into a science, with transportation of raw materials, components, and finished goods weighted and related through integrated study. Intensive research is going on to determine the optimum in centralization and decentralization of business activities.

> *"The increase in productivity, added to our present position, can provide us with the means to carry out programs in our economy which, today, are only wishful thinking."*

The art of classification has been a great aid to the thinking out and organizing of all the problems which man has attempted to solve. By classifying various characteristics of the physical and the abstract, we have been able to use the mechanism of the human mind. The mind seems to work best when it has some tangible evidence of a phenomena which it can recognize and comprehend. When the problems are complex, we artificially break down the situation and attach labels to these various phases. We gain because our vision of the problem can be sharpened as we look at the pieces. On the other hand, we pay a price because the artificial classifications tend to take on definite characteristics of separated units. We may forget to go back and see the broad sweep.

The case at hand is "material handling." Notice how the above comments on world and national transportation are extensions of what we normally think of as "material handling" in plant activities. The break-off point is artificial. That which follows is an attempt to look at this problem—i.e., what is the optimum way to look at material handling activities as a phase of our economic efforts?

Economists have found it convenient to trace an end-product back through its stages of distribution, production, and procurement. These classifications have been useful because they separate activities into problem areas which are quite different from one another. The real merit is that specialists can be developed to concentrate in these various problem areas. Thus, we are able to point to real progress in the fields of purchasing, production control, and marketing. The big problem that still faces top-management is: How can these separated parts be pulled back together for smooth operations?

> *"Whereas mechanization has been a process of replacing muscles, automation will not replace the human mind —but it will certainly stretch our imagination."*

The diagram which follows is a configuration, or a "model", of the scope of material handling as it spans the phases of procurement, production and distribution. It is deliberately a comprehensive picture which can later be narrowed down to isolate what may be considered the material handling industry.

W. Grant Ireson has covered the breadth of this diagram when he defined material handling as follows.[3]

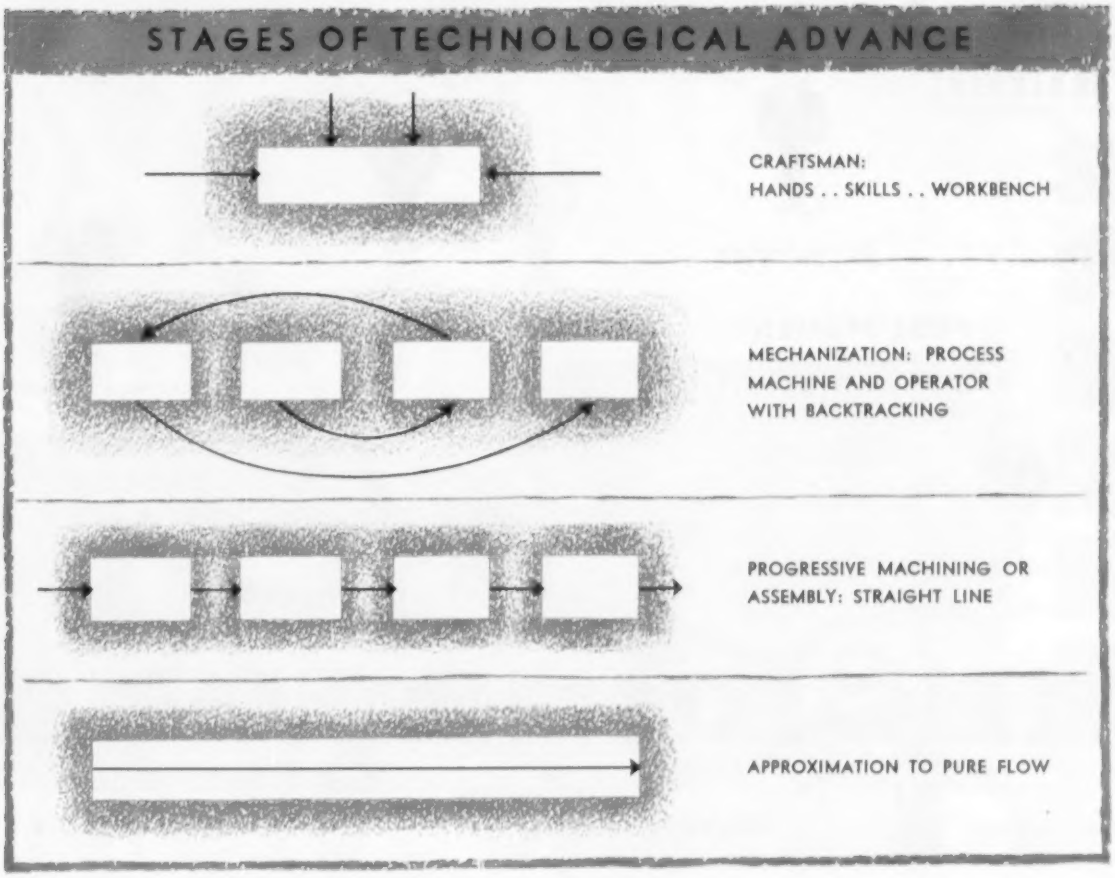
> "Material handling" refers to any movement of materials, whether the movement is vertical or horizontal or both, and also whether the movement is being accomplished by mechanized means or by hand."

Like any other "field," material handling can be artificially broken down into sub-sections. Such classifications are most helpful when they put together problems of a specialized nature. This is the thought behind the diagram. It looks at the entire field, separates problem areas and blends them back together.

We often find, to our discomfort, that for different problems the same word can have different meanings.

For some problems, material handling can be defined as covering the scope of the shaded area in the diagram. In a sense, this is the central core of material handling activity. This is the problem area of inter-

[3] W. Grant Ireson, *Factory Planning and Management*, New York: Prentice-Hall, 1952.



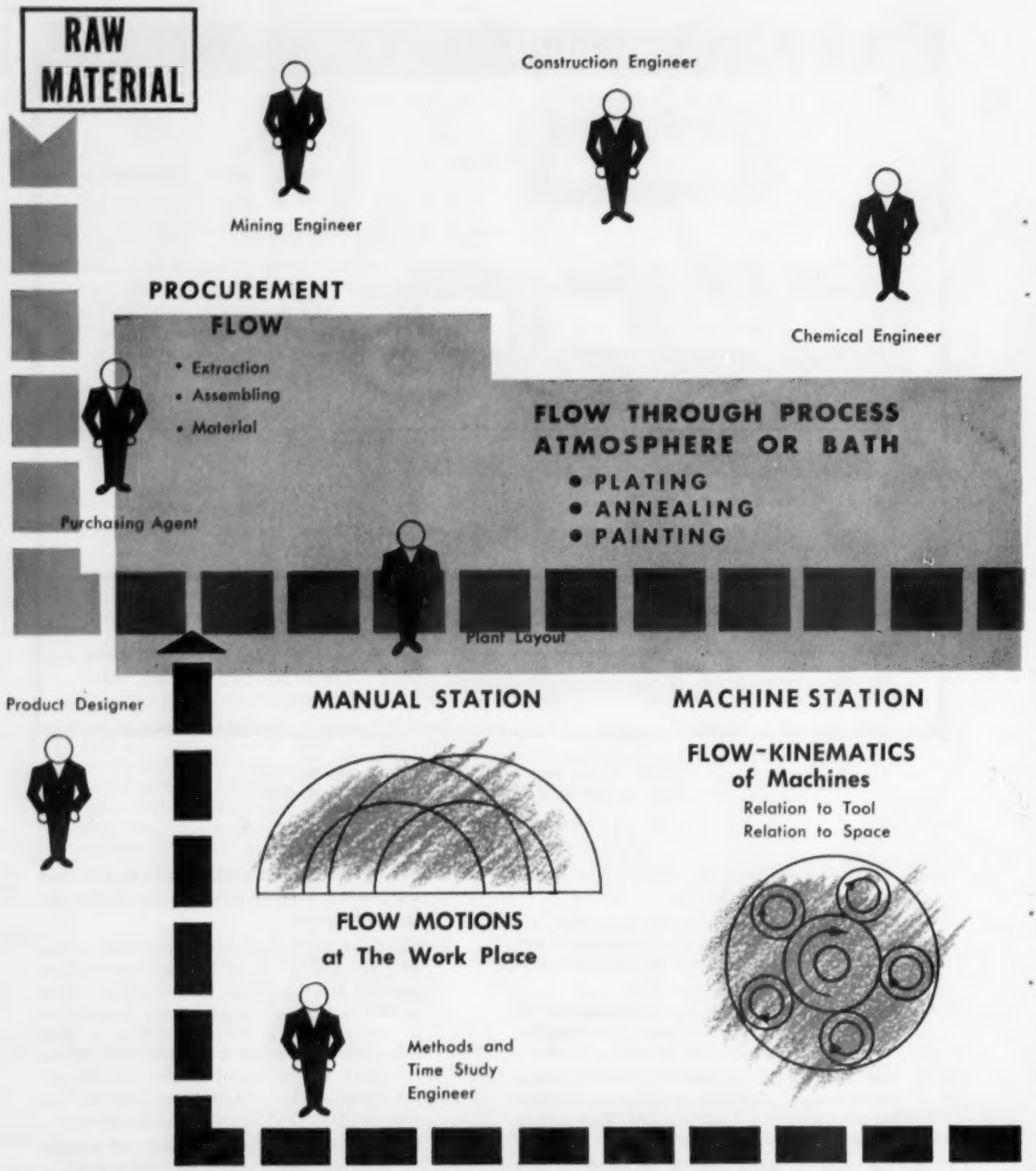
ADVANCES in our economy will produce products which have been precluded by limits in methods of production.

production-station transport and transfer. Note that it overlaps into both procurement and distribution.

Now the diagram expands internally into other production stages, externally back into procurement and forward to the markets. A sequential development of the diagram would be as follows:

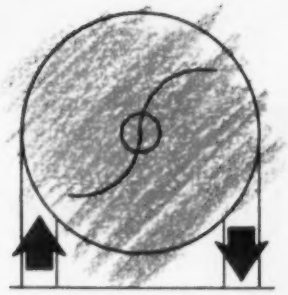
1. Add transport to work-in-process storage. (Problems worked out between Material Handling Engineers and Production and Inventory Control.)
2. Add plant assembly of raw materials and plant warehousing. (Problems worked out between Material Handling Engineer and Warehousing Specialists.)
3. Add external transportation of goods to and from plants. (Problems worked out among Material Handling Engineer and Transportation Management, Product Designers and Packaging Engineers.)
4. Add manual station. (Problems worked out between Material Handling Engineer and Methods and Time Study Engineer.)
5. Add kinematics of machines. (Problems worked out between Material Handling and Mechanical Design Engineer.)
6. Add construction equipment (bulldozers, cranes, etc.) as a special case of both movement of raw materials and machining. (The bulldozer cutting a cellar can, with a stretch of the imagination, be compared to a drillpress drilling a blind hole.) The flow concept is the same—it is the environment of the operation that is different. (Problems worked out between Material Handling Engineer and Construction Engineer.)
7. Add material handling accessories and services.

The composite diagram covers pure flow or movement as it occurs in any form, in any phase, from procurement through to the market. For problems of the industry as a whole, a major portion of the diagram is involved. Particular companies and individuals should be able to "map out" their subdivisions of the diagram—i.e., the problems ($) to which they can commercially present solutions.



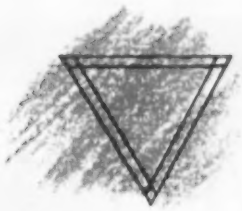
(CYCLE REPEATS THROUGH SUCCEEDING STAGES OF PRODUCTION TO . . .

THE FLOW CONCEPT



CHEMICAL STATION

Inventory Control



STORAGE
OR
AGING
STATION

MATERIAL HANDLING ACCESSORIES and SERVICES FLOW BETWEEN STATIONS

- HAND TOTE
- HAND TRUCK
- POWER TRUCK
- CONVEYOR
- PIPE-TUBE
- CRANE

Production Control

Warehousing
and
Transportation

DISTRIBUTION FLOW

- Truck
- Train
- Plane
- Ship
- Pipeline

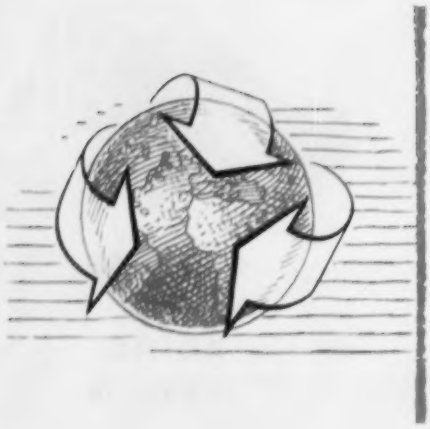
Machine
Design
Engineer

STORAGE and WAREHOUSING LOCAL DIST.

. . . FINAL CONSUMPTION)

ENVIRONMENT OF MATERIAL HANDLING

CONSUMER



PART III

The Extent of Material Handling Opportunities

THE DIAGRAM, Pages 90 and 91, can be viewed as a "map" locating opportunities that are really reflections of problems of cost reductions as seen by the material handling industry's present and potential customers. If we confine our thinking to the central shaded area of the diagram, we limit the potentialities of the material handling industry to the traditionally accepted figure—"30 percent" of manufacturing costs.

To be concerned with supplying mechanical equipment to improve an area of only 30 percent of all manufacturing costs may well give a potential to the material handling industry. However, we might well take the broader attitude and accept the views of many who feel that material handling costs total between 70 and 80 per cent of all manufacturing costs. Certainly Ireson's definition includes this view. Over and above the traditional "area" of material handling equipment, the industry should recognize and concentrate upon the potential market for sales covering at least eight other "areas" of cost reduction. They are:

1. Intra-and Inter-Process Packaging and Storage

In a large canning plant, cans were originally delivered wrapped in large, kraft paper packages. This system required stacking, packing and wrapping at the can manufacturing plant, and storage, handling and loading in box cars. At the canning plant it required unloading, movement, storage, rehandling, unwrapping, movement and finally placing on conveyors. An industrial truck manufacturer recommended the purchase of fork trucks, and a substantial saving was effected in movement and storage space. A short while later, a conveyor manufacturer recommended the use of collapsible conveyors and the elimination of the wrapping and unwrapping operations by continuous stacking in the box cars, as well as the use of a multi-toothed picker. This system was installed, and a further saving was effected; the paper cost was entirely eliminated. Then, in constructing a new plant, the company located across the street from a can making factory, and the entire operation was finally simplified to a continuous conveyor going between the two plants—the can making and the canning machines were synchronized. The material handling method, therefore, became an integral part of the total manufacturing process, and a substantial cost reduction far above the traditional 30 percent was effected.

2. Unit Direct Productive Labor Costs

Ordinarily, the material handling industry considers itself dealing only with "indirect" or "burden" labor costs. Very often, increased individual productivity on direct workers results and unit direct labor costs are greatly reduced through the proper application of material handling equipment. This function of tying together production stations at a constant speed, and with work progressing at a convenient and uniform height, builds a rhythmic pace and results in greater savings than those from the handling equipment alone.

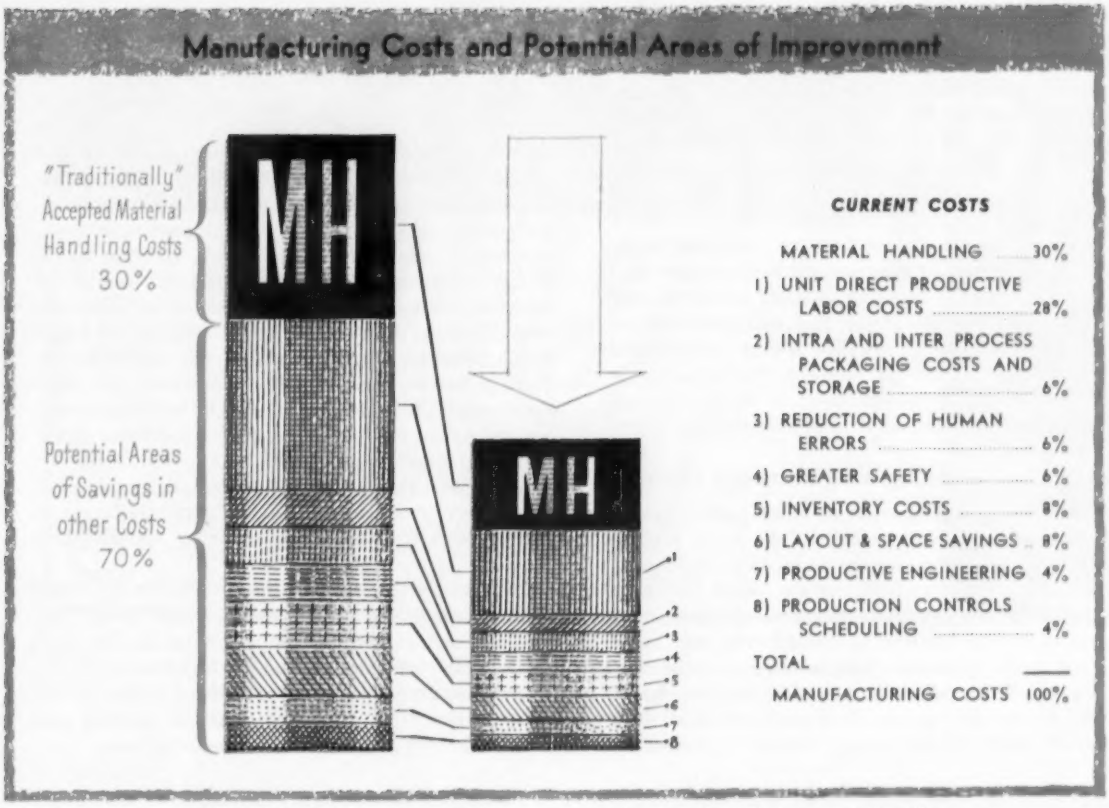
Dr. Morris Viteles, Psychology Department, University of Pennsylvania, in his book, *Industrial Psychology*, states that rhythm of work imposed by the moving belt almost invariably tends to increase the rate of production of direct labor.

> "It was found that rhythm increased production by 17.8 percent. The rhythmic work was also accompanied by less fluctuation in the rate of work and by a marked increase in the interest and satisfaction of the subjects who, in general, expressed themselves as feeling less tired when working with an imposed rhythm."[4]

3. Overall Cost Reductions in Manufacturing

The combination of mechanical, chemical and manufacturing cycle time into a coordinated, timed and mechanically controlled material handling system can greatly lower reject ratios, assure correct delivery points, and even weigh or piece count in transit. A

[4] *Viteles, Morris, Industrial Psychology* (1932) *p.* 504


Manufacturing Costs and Potential Areas of Improvement
"Traditionally" Accepted Material Handling Costs 30%
Potential Areas of Savings in other Costs 70%
MH
MH
CURRENT COSTS
MATERIAL HANDLING 30%
1) UNIT DIRECT PRODUCTIVE LABOR COSTS 28%
2) INTRA AND INTER PROCESS PACKAGING COSTS AND STORAGE 6%
3) REDUCTION OF HUMAN ERRORS 6%
4) GREATER SAFETY 6%
5) INVENTORY COSTS 8%
6) LAYOUT & SPACE SAVINGS 8%
7) PRODUCTIVE ENGINEERING 4%
8) PRODUCTION CONTROLS SCHEDULING 4%
TOTAL MANUFACTURING COSTS 100%

MINIMUM of eight phases subject to cost reduction through improved handling.

fully integrated material handling system goes far beyond the sale of "pieces" and "bits of equipment." No longer can we conceive of a conveyor or a fork truck as being a single sale and as a complete integral unit. It must be a part of the whole integrated system where decisions, counts, cycle controls are all built into the system and the vagaries of human nature are discounted. The material handling industry must rise to the challenge of designing and selling complete "packages" rather than bits and pieces. Such a package would permit no variation of error in the correct time for heating, cooking, cooling, washing, drying or painting.

4. Greater Safety

Industrial accidents, hospitalization plan costs and workmens' compensation payments are raising the total cost of manufacturing at an increasing ratio each year. We have been forced recently, with the development of atomic plants, to develop complete material handling systems for safety alone—safety from atomic radiation—including mechanical hands and robots. These lessons and the frightful cost paid each year by America in industrial accidents should serve as tremendous impetus to the material handling industry towards designing and selling equipment to reduce accidents. Fewer accidents mean lower insurance and compensation costs and lower social welfare costs to take care of the physically handicapped. Safer operations promote confidence among workers, and industrial relations costs are lower. The fewer times a man has to lift, get his fingers in the way, climb stairs, or even be near something dangerous, the safer he is and the lower manufacturing costs are.

5. Lower Inventory Costs

By going from process to product flow layout, many industries (such as the automotive) have reduced inventories in process to almost nothing. Lower inventories mean less capital tied up, less floor space required, less heat, light and protection needed, and far less danger of product obsolescence or of getting caught in inventory adjustments. The material handling system can raise or lower inventory costs, depending upon its completeness and integration. Continuous flow and minimum inventory can even be achieved in process (batch) type layouts with loop and feedback conveyors, thereby reducing overall inventory costs often more than the total savings in actual handling of material.

6. Savings in Physical Layout and Floor Space Costs

Many industrial concerns do not have accurate lay-

outs and floor space allocation cost figures. Yet we must be able to compute the savings from the use of equipment such as overhead cranes, fork lift trucks, portable elevators, etc., that take advantage of our so-called "air rights." A recent methods project of a large electrical manufacturer in Philadelphia saved *nothing* as a result of better equipment, methods or motions. Yet the project's realized savings were over $80,000 per year. How? Simply because 10,000 square feet of space was returned to manufacturing, for which a charge of $8 per square foot per year was being made. In these days of astronomical building costs and rentals, the material handling industry would do well to concentrate on equipment that can maneuver in small aisles and can be installed with a minimum of effort and be flexible for changes. Space saving is likely to be a major consideration in the purchase of material handling equipment during the next ten years.

7. Savings in Engineering Costs and Control

A fully integrated material handling system can be installed under the newer ideas of "designing production lines and then building the building around them." More and more factory buildings are merely becoming "skins" to house the production line. An integrated system shows up bottlenecks immediately, and methods and work standards changes can be immediately engineered. When the system is worked out beforehand, "bugs" do not often appear. With engineers of all types extremely scarce in our present market, a correct design the first time is a real must.

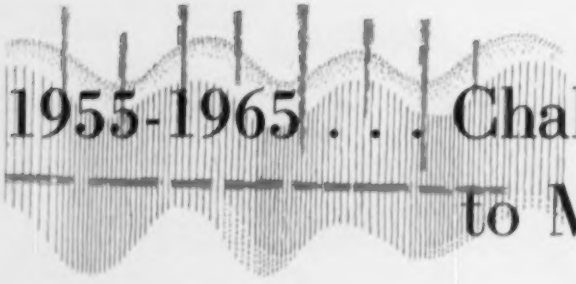
8. Reduction of Scheduling and Production Control Costs

When the material handling system integrated with the production system regularizes and controls the amount and kind of production each day, week and month, orders can have assured delivery dates; salesmen can keep promises; loads ahead can be regularized; and total costs will decline. Shipments, billings, receivables, advertising release dates, vacation schedules, hiring rates, planning of new capacity and all the complex relationships can be planned *at minimum costs*. With the possibility of guaranteed annual wages facing manufacturing industries—today and in the immediate future—fluctuations in production will cause *extra* costs. A fully integrated material handling system can more than pay for its equipment purchases in the savings of levelled production.

It has been the experience of the authors that each of the above mentioned costs can frequently be cut in half through the application of better material handling.

Thus we see that, large as they often are, the direct savings in handling alone are only a part of the total potential savings and sales opportunities for the material handling industry. Instead of concentrating on the 30 percent, the industry can make great strides by developing new products and new uses for existing ones in the other 70 percent of manufacturing costs.

PART IV



1955-1965 . . . Challenge to Material Handling

THE REPLACEMENT of a series of operations by an integrated system of automation reflects the solution of a problem requiring the substitution of a decision-producing device for certain elements of the human mind—e.g., recording, memorizing, etc.

In *thinking* of automation, much higher levels of abstract thought are required. This is a logical consequence of the challenge to simulate mental activities. Necessarily, we are faced with the need to broaden the scope of our thinking from a piecemeal approach to manufacturing to a concept of flow which is radically extended. We can have a machine "think out" only what has first been developed in the minds of men. Thus, progress will be primarily dependent upon the breadth of vision of decision-makers.

The word "theory" is to gain a common respect that it never had before. As we seek to solve problems of increasing complexity we must theorize, i.e., find convenient ways to think about difficult problems. We must innovate different ways to think about these prob-

PRODUCTION OF MATERIAL HANDLING EQUIPMENT

Figures in Thousands . . . Value Shipped

YEAR	ALL CONVEYORS EXCEPT OVERHEAD AND TROLLEY	TROLLEY AND OVERHEAD CONVEYORS	INDUSTRIAL TRUCKS-TRACTORS & ACCESSORIES	OFF-THE-ROAD CONSTRUCTION EQUIPMENT	TOTAL
1947	196,832	37,242	156,754	200,000 EST.	590,828
1948	NA	NA	151,573	231,088	
1949	NA	NA	NA	NA	
1950	181,137	59,559	166,259	314,325	721,270
1951	254,732	92,889	285,248	764,958	1,397,847
1952	280,737	126,274	322,166	820,929	1,550,106
1953	299,265	NA	321,843	865,331	

HANDLING equipment manufacturers can anticipate great increases in demands for their products in next decade. (Statistics from U.S. Dept. of Commerce.)

lems. An example of an abstraction is appropriate.

The electrical engineer views electricity as *going through* a wire when he solves problems of application of electricity to home lighting and cooking. It is convenient to think this way—tests can be made—and results are produced as seen in the average kitchen.

In other instances, such as television and radar design, the electrical engineer finds it convenient to think of electricity as moving along the *outside* of a wire, e.g., a wave guide.

Actually no one knows what electricity is—but, by inventing ways to think about the phenomena, we have, in turn, added greatly to our standard of living.

Similar thinking can be applied to the concept of automation, e.g., "liquidity" of flow for any sort of production. All this means is that, at some step in an analysis of our production, we are aided by "making believe" that our product has the characteristics of a liquid. By such thought we are led to provide facilities which remove the friction to smooth flow.

Just as automation has extended the concept of mechanization, the concept of flow extends the field of material handling. Whereas mechanization has been a process of replacing muscles, automation will not replace the human mind—but it will certainly *stretch* our imaginations.

Past, Present & Potential Market for Equipment

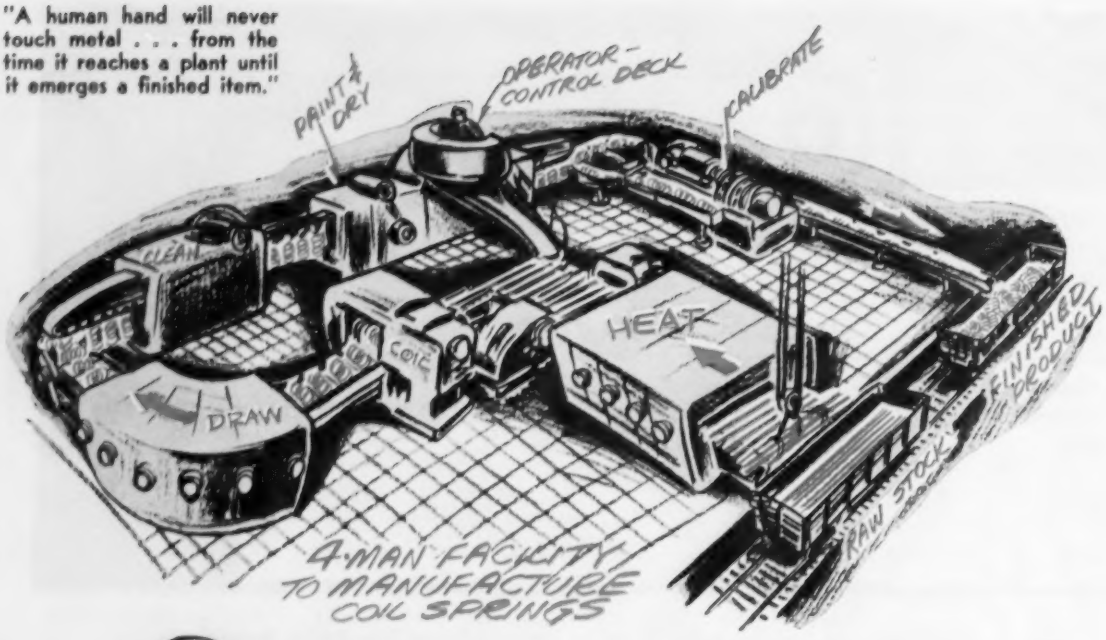
It can readily be seen from the accompanying table that serious consideration should be given to reclassifying material handling industry statistics in order to include more of the classes mentioned in this article.

However, even from the meager statistics available, we can see that the industry went from 591 million dollars sales in 1947 to 1,550 million dollars sales in 1952—or an increase of approximately 20 percent per year. If we contrast this figure with the 3 percent per annum total improvement factor in productivity from 1929 to 1954, it would appear that the material handling industry has enjoyed a far larger relative rate of change than industry in general.

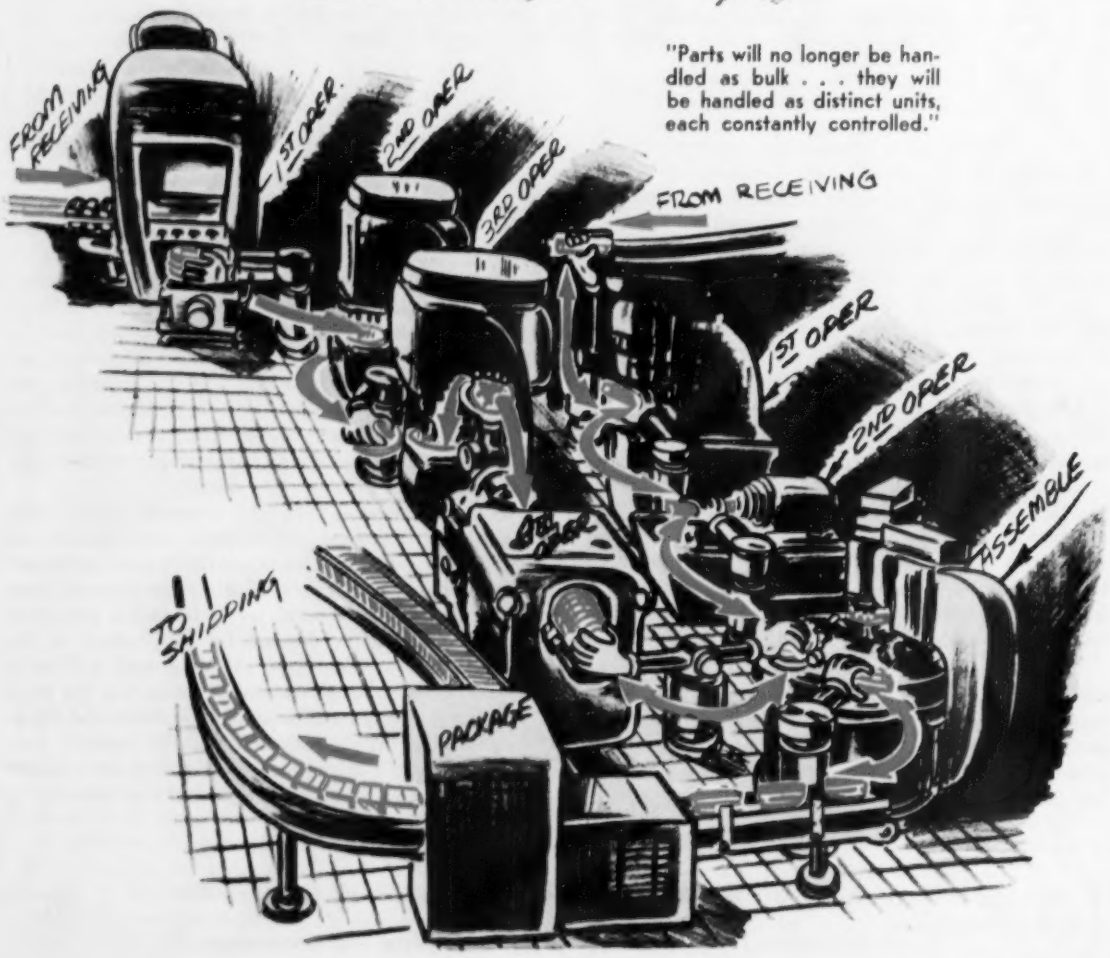
If we then combine the total potentials of the eight other areas mentioned in this article—and take into account the tremendous pressure of rising costs in the raw materials and extractive industries—the material handling industry, in general, seems to face a period of rapid growth in the demand for its products in the period 1955 to 1965. Some of this growth will be in expansion of presently cataloged items, but the most significant changes will be in the integration and extension of material handling systems. The material handling industry will connect closer and closer together the raw materials and the markets of our economy.

"... we must advance and share our gains if our system is to withstand the onslaught of creeping communism."

"A human hand will never touch metal . . . from the time it reaches a plant until it emerges a finished item."



"Parts will no longer be handled as bulk . . . they will be handled as distinct units, each constantly controlled."



The Future of Handling....

Automatic

HANDING?

By Charles Hautau, President, Hautau Engineering Company.

THE metal working industry is in the closing phase of an era. In a few more years we will see that phase accelerating to a rapid finish.

The current industrial period in this industry, which began about 1900, might be called "The Bulk Handling Era." (This expression is applied here only to the production and assembly of metallic products—it does not concern the handling of bulk materials such as chemicals, food products, ore, ash and the like). In this period we learned to move, by mechanical means, large quantities of bulk metal stocks, bulk parts, and bulk components.

Is Automation Really New?

Ideas for mechanical handling to, in connection with, and from metal working machines started to generate in the minds of such men as Frank Gilbreath around 1910. He recognized the human limitations. As a matter of fact, his discussion of "Automaticity", published in 1911, included a definition which, today, is considered in the only slightly modified expression, "Automation". We now recognize that Gilbreath and other pioneers in time and motion studies were the progenitors of mechanized material handling, which replaces—improves upon—the human hand.

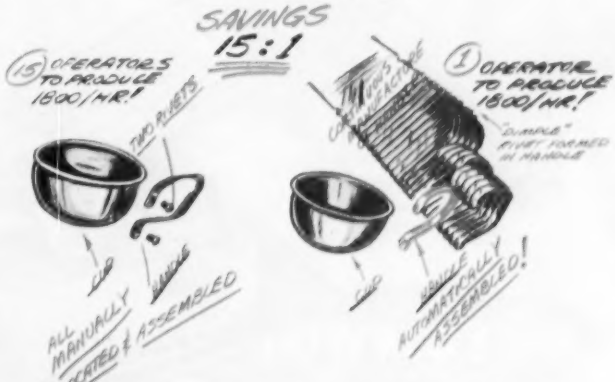
Techniques and equipment for the bulk handling of materials and parts have continued to progress, but it has become apparent that they cannot, by themselves, handle a production job in the age of automatic operations. The concept of continuous flow has become one of full integration of handling and production machinery.

For such integration, parts will no longer be handled as bulk; regardless of size or weight, they will be handled as distinct units, each under constant control, as it moves to, during, between, and from machine and assembly operations.

A human hand will never touch metal in process from the time it reaches a plant siding until it emerges from the factory as a finished item. Handling to and from production equipment or conveyors will be automatic. Orientation of parts in process will be machine controlled. Parts will travel from operation to operation faster than the eye can follow. Inspection, fully automatic, will not slow down production for even a fraction of a second; it will assure a more uniform product, a better product, than we are capable of making today. In short, automation will provide "management" of machinery, process and product.

And who—or what—will operate this plant? Brains, not brawn! There will be no levers, handwheels, or handles to move. There *will* be buttons and switches,

(More on next page)



"Frequently slight redesigning will produce not only easier and faster handling but also better products."

controlled by men who know every element of the operation for which they are responsible. Personnel will be aided in their work and kept in close touch with each other and management through the latest means of communications—radio, television, telescribers, facsimile and photographic equipment. There will be no need or place for poor communications. Production areas will be compact; the activities of scattered personnel that may be required will be fully coordinated at every instant. The entire organization will be integrated so that men and machines can respond together perfectly and instantly to meet demands of the master merchandising mind—management.

And if you really think this is just day-dreaming, you're in a dangerous state of mind. You may find, suddenly, that others have realized these things, that you have been left so far behind you may as well retire—or start another business. You won't be able to catch up with an alert, automation-minded competitor.

And Here's Why Not

Why can such positive statements be made? Here are just a few of the more obvious reasons:

Patents issued prior to 1938 have expired—and in the thirties and late twenties many of the most significant advances were made in machine tool and basic product designs. Patents from now on will largely be issued for important product modifications and methods of manufacturing—with such

Charles Hautau

modifications very frequently dictated by needs for improved production methods.

Successful competition will result from more efficient manufacturing methods and not from characteristics of products. Companies, which can trim every cost corner, in any industry, will be the ones that will survive.

If you are supplying parts to a company where management and engineers are thinking in terms of automation—and you are doing nothing about it—that company could take the job out of your shop and incorporate it into its own new set-up. This has already happened to a number of suppliers in the automotive industry. You can beat this trend only by mechanizing your own operations before the customer can, and thereby keep

(Continued on page 140)

"If new machines are going to be needed . . . they should be purchased with the anticipation of automation."

On the fold-out which follows are designs for fully mechanized handling systems. (Upper left is a view showing how a press operation can look today.)

On the press line stock feeds from an automatic straightener and shear. All units are synchronized to load and unload simultaneously. Between presses parts can be held in the same position or, through slight adjustment, inverted.

Finished parts are unloaded at the right and automatically hung on the conveyor to the assembly line.

The entire operation is controlled by one man at a console, using closed circuit TV (see cameras at each press).

The sketch at the lower right shows how units move out of the way for die servicing by crane or truck.

In the production line, raw parts from receiving feed in on conveyor (1) to receiving, inspection and orienting unit (2).

Parts passed go to the double-line overhead conveyor (3) for feeding to automated machine tools by loaders (4). Parts are picked from one conveyor line, machined, and placed in the second line.

All parts are gaged after each machining at the feedback control (5) and again at the final inspection unit (6). Finished parts then proceed on conveyor (7) to assembly or packaging.

Do Not Tear!
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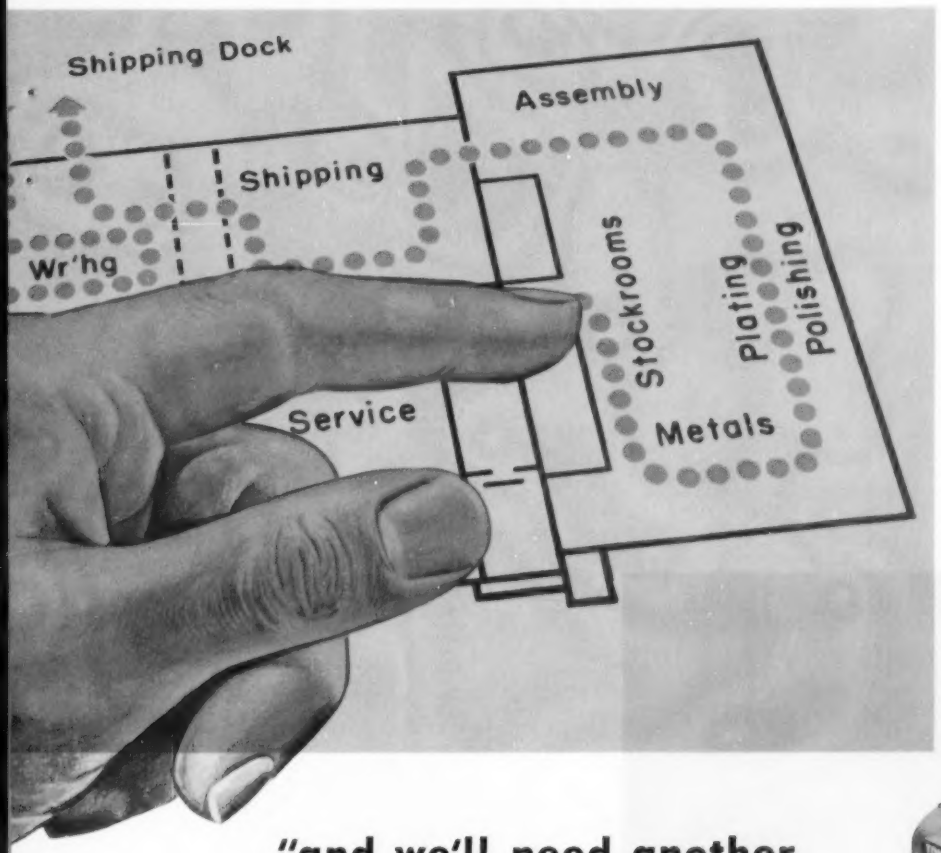
PLAN ON TOWMOTOR

for modern methods of materials handling



"and we'll need another TOWMOTOR in this area..."

It would be an understatement to say that Towmotor Fork Lift Trucks have found their place in American industry. *Places* is the word you want--for throughout almost every kind of plant in virtually any type industry, the versatility and efficiency of Towmotor Mass Handling are at work lifting the load off manual labor—and adding additional black ink to the company ledgers.

And when you look at the future of your operation, you'll be wise to include a Towmotor wherever a job calls for handling. Because the fact is this: Towmotors move more tons per dollar than any other method or machine.

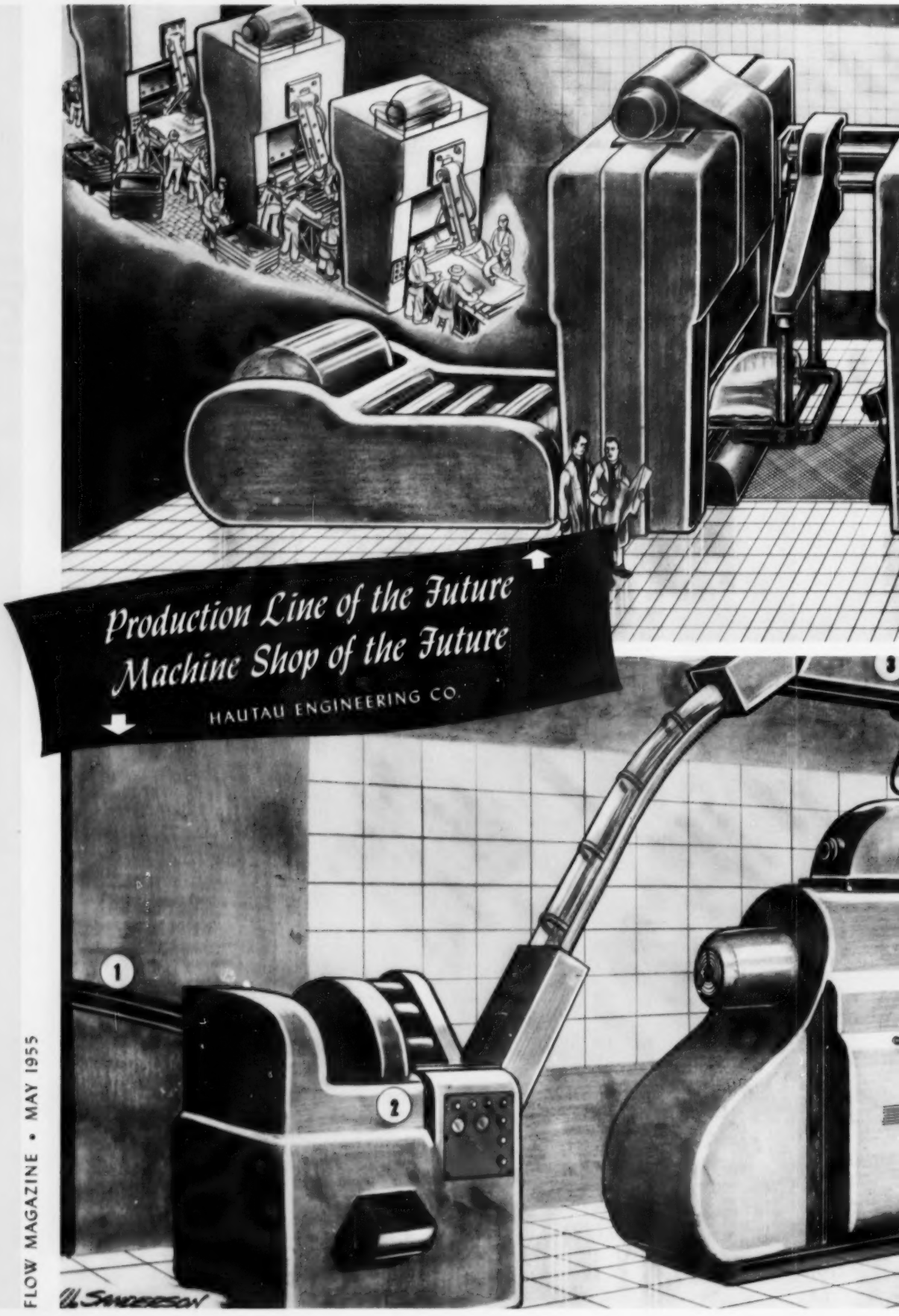
One Towmotor in the right area can make a profitable difference in your operations. *Several* Towmotors in the right *areas* can make a management team look like magicians.

Want proof? Look on the next page.

TOWMOTOR
THE ONE-MAN-GANG ®

FORK LIFT TRUCKS and TRACTORS

SINCE 1919


Production Line of the Future
Machine Shop of the Future
HAUTAU ENGINEERING CO.
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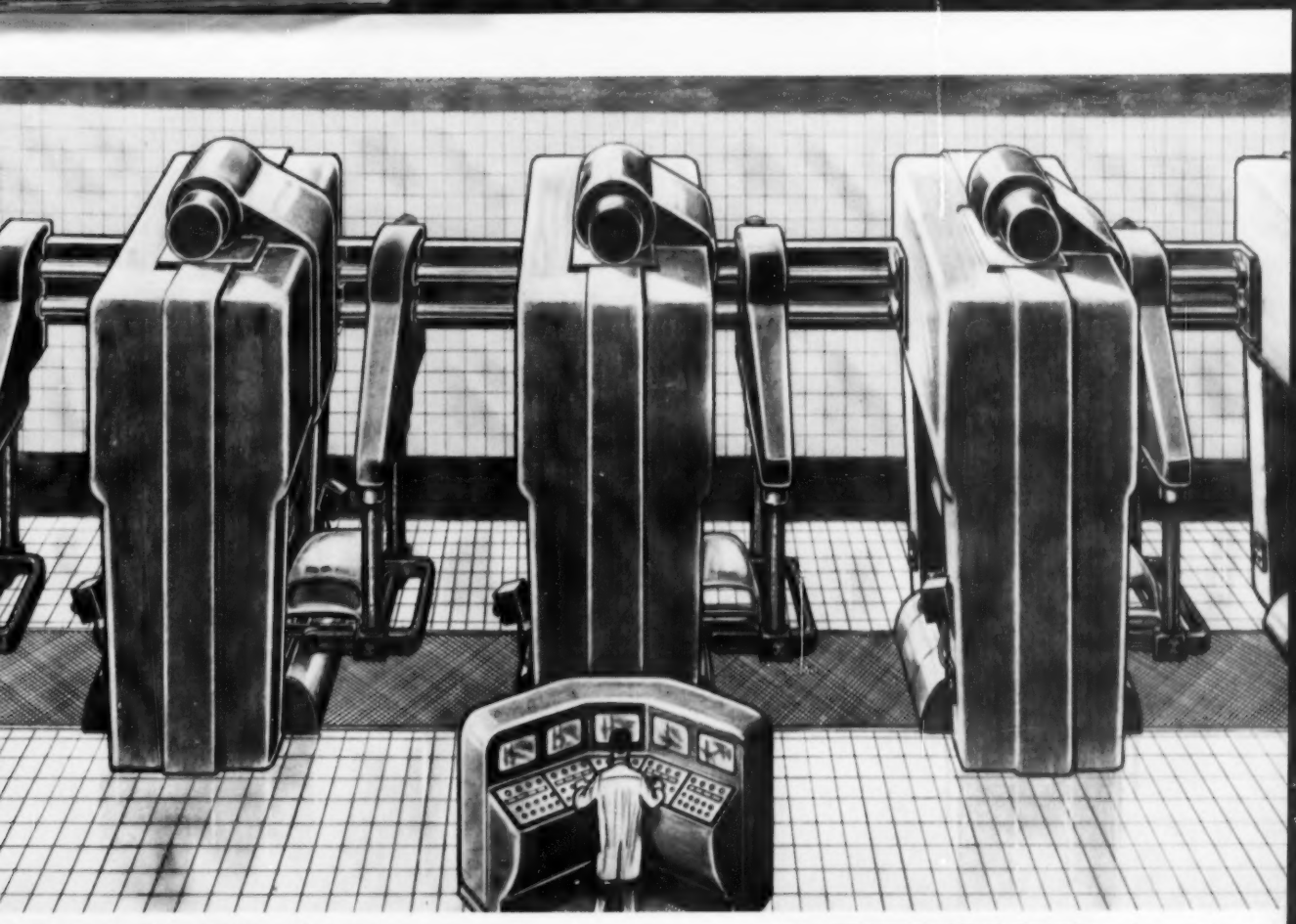
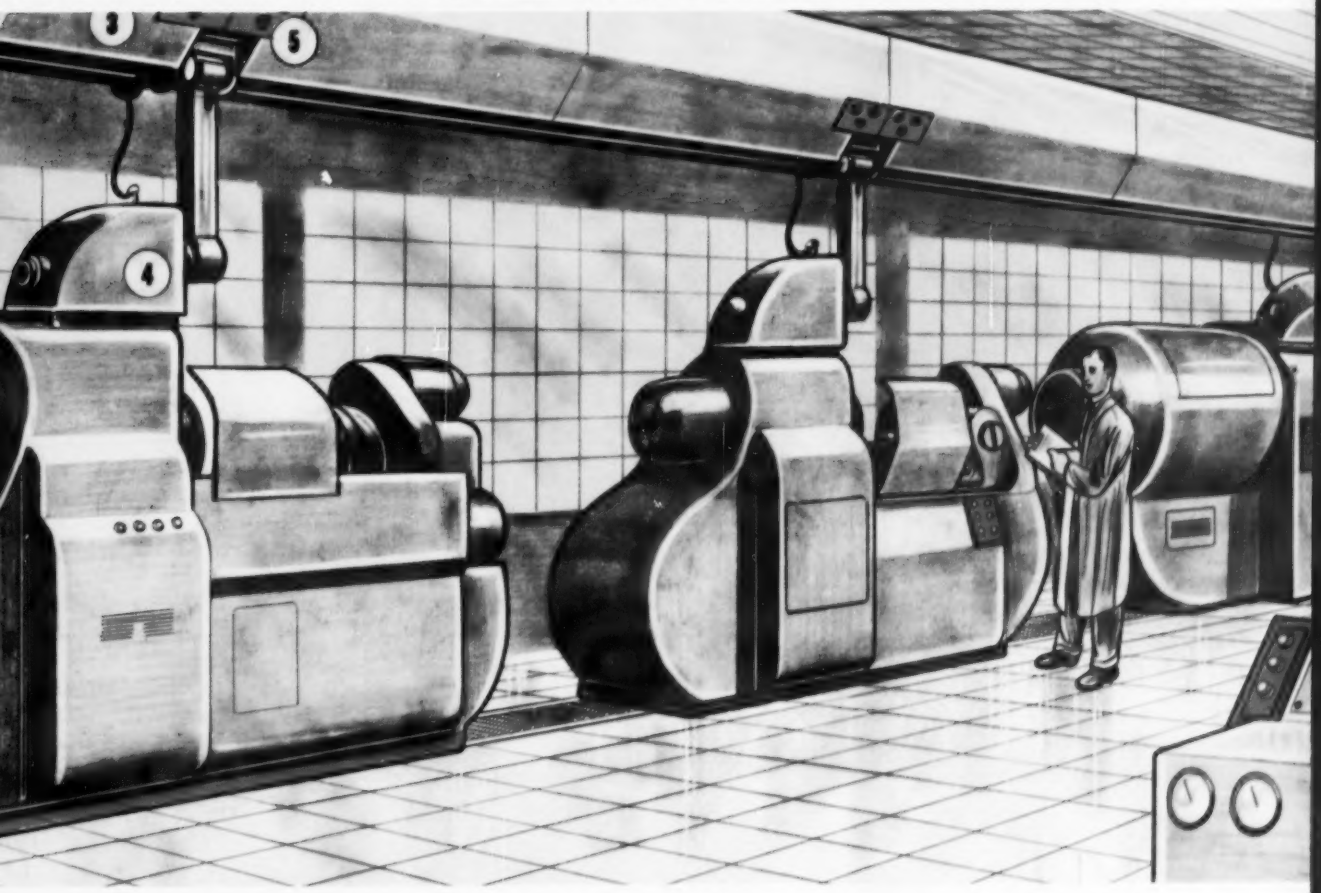
2
3
SANDERSON

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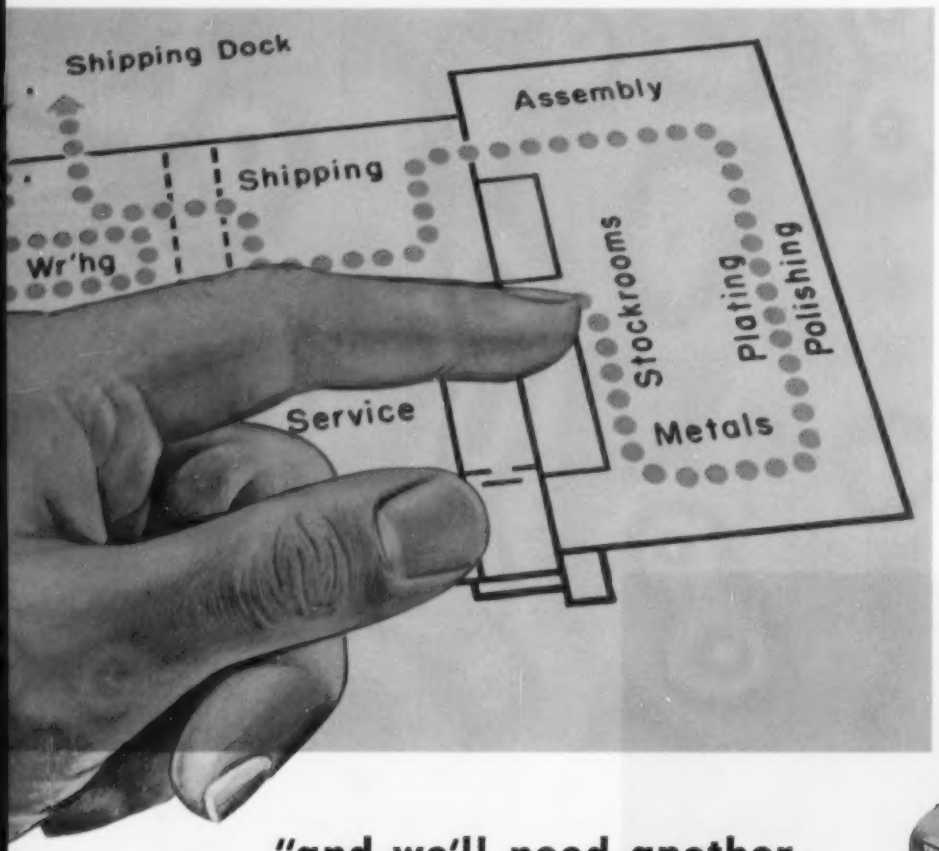
PLAN ON TOWMOTOR

for modern methods of materials handling



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TOWMOTOR
THE ONE-MAN-GANG ®

FORK LIFT TRUCKS and TRACTORS

SINCE 1919

the "hands" of a TOWMOTOR cut costs for you

First, let's understand that a Towmotor is a fork lift truck. It lifts tremendous loads for high stacking. But to get an idea of what else a Towmotor can do to shrink costs, read about these strong "hands"—the ingenious, interchangeable accessories that really make a Towmotor a "one-man-gang."

HANDS THAT PUSH LOADS: Towmotor Unloader
HANDS THAT PUSH AND PULL LOADS: Towmotor Tow-Loader
HANDS THAT SUSPEND LOADS: Towmotor Crane Arm
HANDS THAT GRIP LOADS: Towmotor Clamp
HANDS THAT DUMP LOADS: Towmotor Revolving Carriage

And, mind you, the above are only examples. There are more than 60 load handling accessories—and with the right accessory, hard-to-handle materials become as tame as a basket full of packages.

Then there's *TowmoTorque*—the superior automatic transmission that takes all the work out of fork truck operation. TowmoTorque with exclusive *Creep-Control* gives full power lift at any travel speed—allows preselection of forward and reverse for time-saving get-away.

Towmotor Fork Lift Trucks have been engineered to bring outstanding Materials Handling advancements to Industry and present planning foretells of even greater advantages. For the ultimate in constant powered fork lift trucks—Gasoline—Diesel—LP-Gas—with industry-leading features, see your nearby Towmotor Representative or write TOWMOTOR CORPORATION, Div. 805, 1226 E. 152nd St., Cleveland 10, Ohio.

TOWMOTOR®
THE ONE-MAN-GANG®
FORK LIFT TRUCKS and TRACTORS
SINCE 1919

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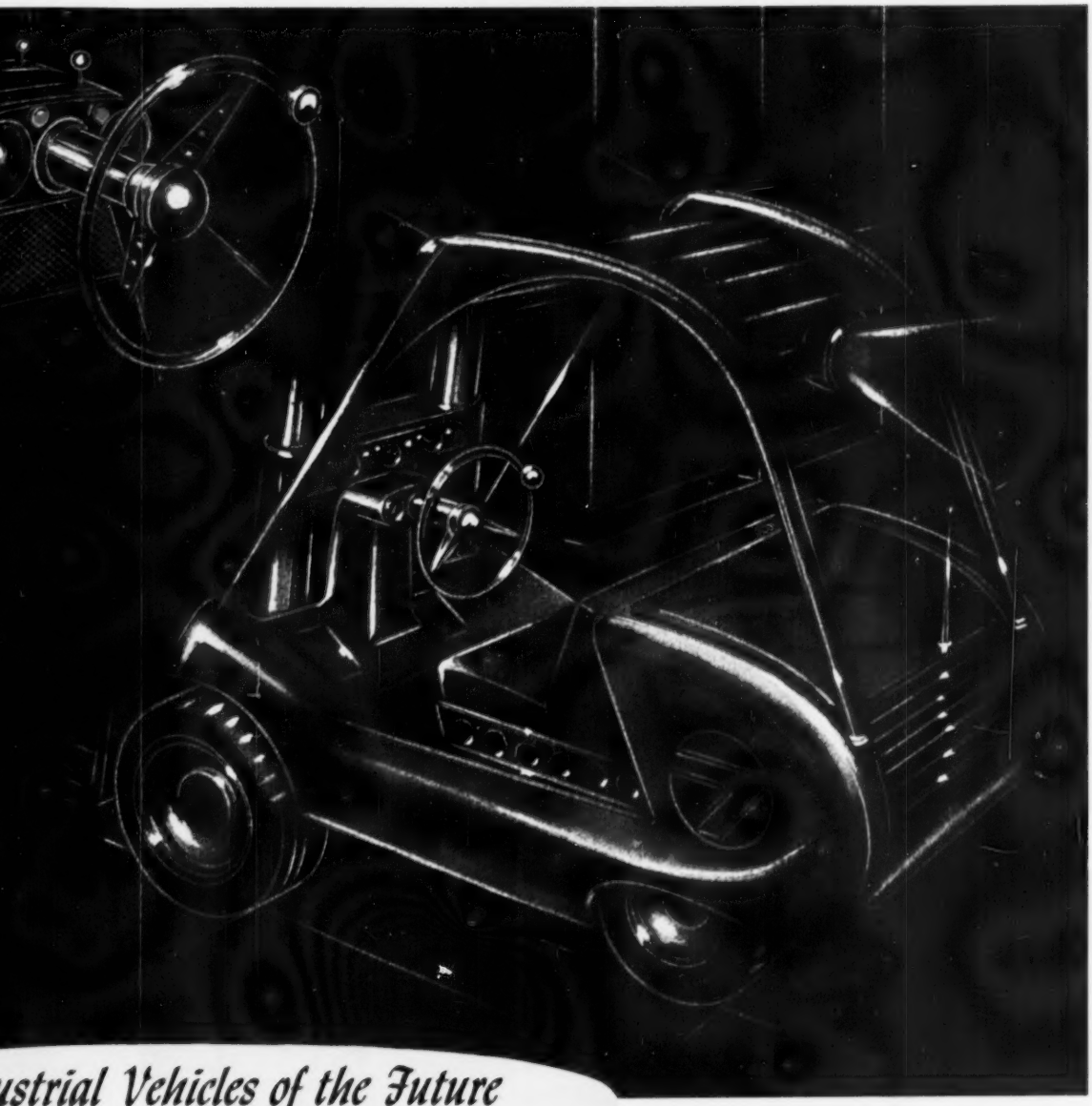
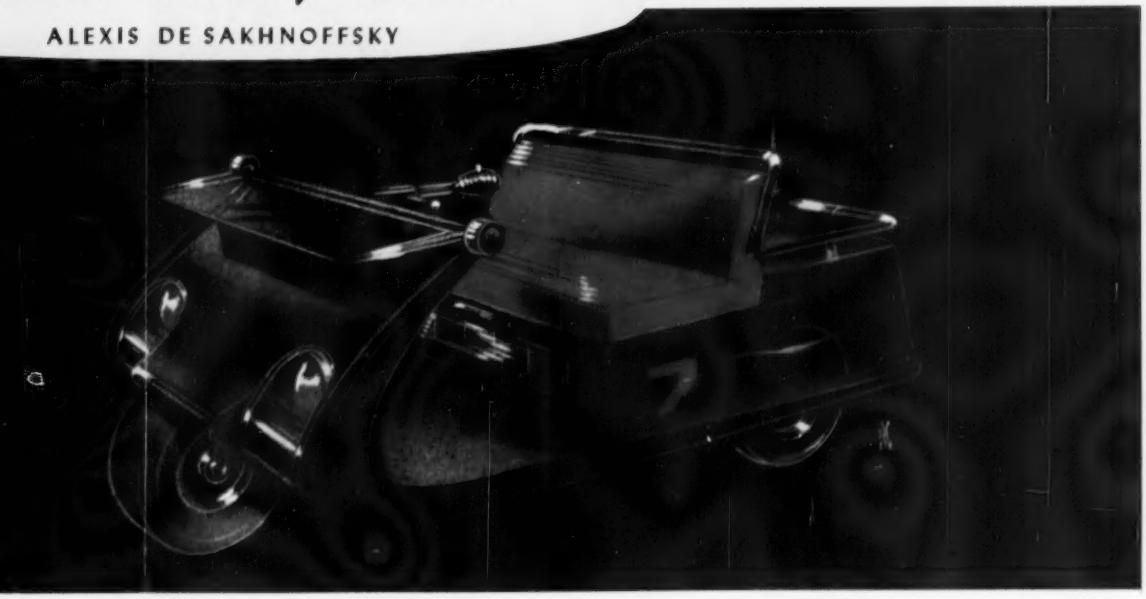
Industrial

ALEXI



ustrial Vehicles of the Future

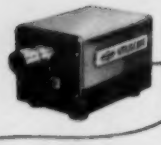
ALEXIS DE SAKHNOFFSKY



DIAMOND "UTILISCOPE"

(WIRED TELEVISION)

SAVINGS Made Today *Forecast* EVEN GREATER FUTURE ECONOMIES



"UTILISCOPE" CAMERA

The Diamond "Utiliscope" (Wired Television for industrial and commercial use) has proved itself an important tool of the future by cutting costs today. Here are a few of many examples.

The "Utiliscope" is surprisingly low in cost. Its image is always clear and stable—it cannot transmit an incorrect image. It is on the job 24 hours a day, day in and day out, with practically no attention. The "Utiliscope" has no human limitations.

Let us tell you how the "Utiliscope" is now saving manpower, improving product quality, increasing production or preventing accidents. There probably is an application you can use to advantage. Write for Bulletin 1136.

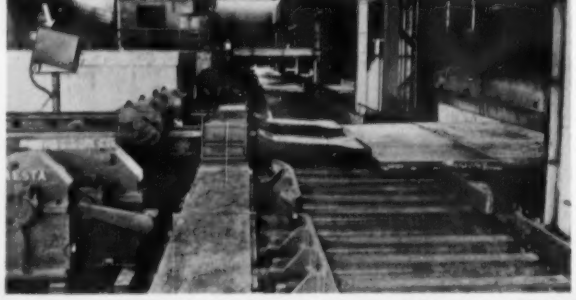
"UTILISCOPE" RECEIVER

FOUR SLAB REHEATING FURNACES ARE CHARGED BY *ONE* OPERATOR USING "UTILISCOPES"

Slabs must be aligned properly before charging into the four reheating furnaces at Fairless Works of U. S. Steel Corporation. Otherwise serious damage to furnace fronts could result. The operator watches the two middle furnaces directly . . . SEES the two end furnaces through the "Utiliscope". Operating costs are reduced and possible misinterpretation of signals is eliminated.

↑ Operator at pulpit SEES on the "Utiliscope" screens when slabs are in correct position for charging the two end furnaces. He then simply shifts lever to actuate proper charging mechanism.

→Arrow points to "Utiliscope" camera (in protective housing) used to watch slab positioning on conveyor and charging of the near end reheating furnace.



DIAMOND POWER SPECIALTY CORP.

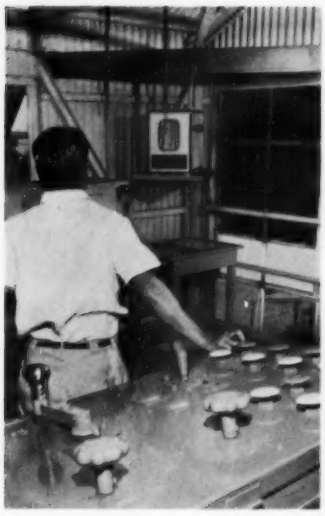
First in Industrial Television

LANCASTER, OHIO • *OFFICES IN 39 PRINCIPAL CITIES*

Diamond Specialty Limited—Windsor, Ontario

Since 1903
Diamond has Manufactured
Quality Equipment
For Industry

ONE MAN WITH "UTILISCOPE" WATCHES SUGAR CANE CONVEYOR to INCREASE OUTPUT and CUT COSTS



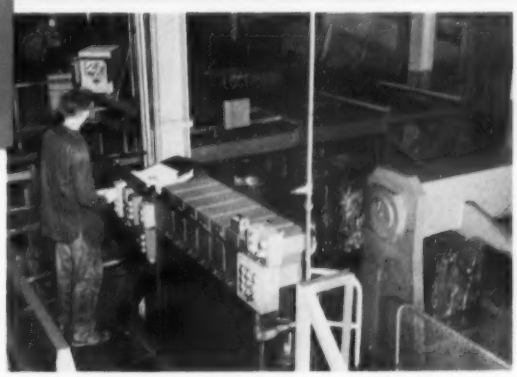
↑ Operator watches "Utiliscope" screen to see level of sugar cane on final conveyor (out of sight, 80 feet away). By adjusting controls he keeps conveyor full and thus increases output.

→"Utiliscope" camera in dustproof case watches amount of cane on conveyor to mill . . . replaces one man per shift.

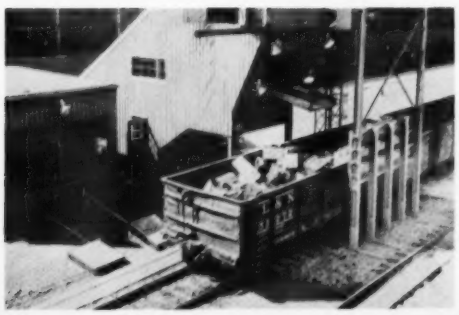
At Ewa Plantation in Hawaii, sugar cane is cleaned, washed and chopped on a series of conveyors so long that it is impossible for one operator to see everything. A "Utiliscope" camera watches the final conveyor to the juice extraction mills which determines output. By watching the screen in his tower 80 ft. away, operator can regulate the speed of the other conveyors so full load is maintained . . . assuring maximum output at all times. In addition to saving labor, possible errors due to misinterpretation of signals are also eliminated.

"UTILISCOPE" ENABLES ONE MAN TO BALE SCRAP, CONTROL CONVEYOR AND LOAD FREIGHT CARS

In a large automobile stamping plant, the scrap baling press operator sees on "Utiliscope" screen the actual loading of scrap in railroad car outside the plant. He regulates conveyor speed, positions car being loaded and moves new car into place as required. Operator no longer depends on signals from a spotter outside the building . . . one man does the work formerly done by two.



↑ On screen of "Utiliscope" receiver, scrap baling press operator SEES how gondola car is being loaded. He moves car and controls conveyor speed as required.



←"Utiliscope" camera (in small housing above and beyond chute) watches car and conveyor chute . . . eliminating spotter formerly needed.

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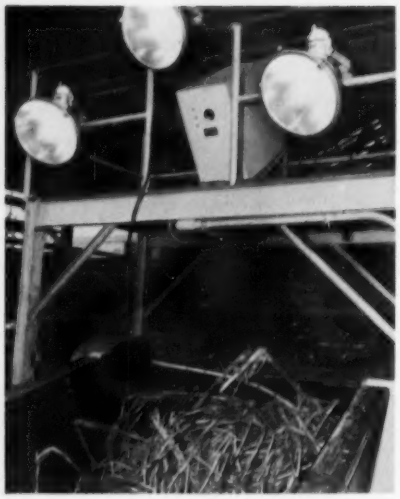

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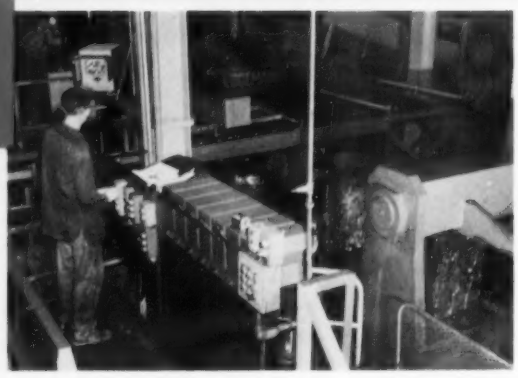

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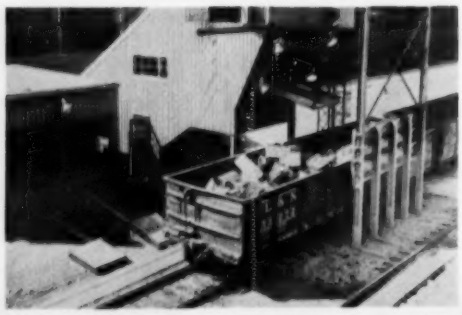

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Industrial Vehicles on the Horizon

By Alexis de Sakhnoffsky

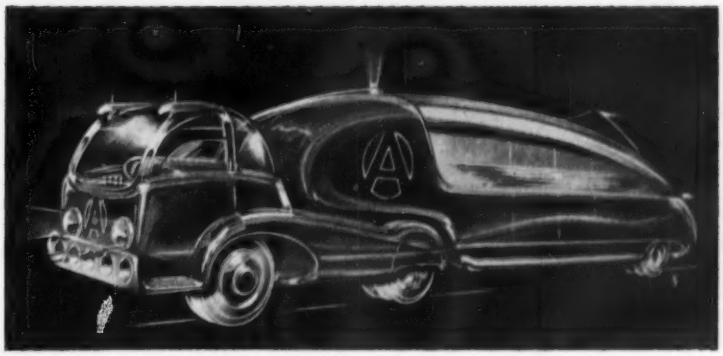
RADICAL refinements, by today's standards, will be built into the vehicles you will purchase for your plant or business a few years hence.

As with other equipment, many improvements will result from metallurgic and electronic research. New developments in power plants and power sources are now in various stages from the laboratory to the testing ground.

Although a design must be built around chassis specifications and special features developed by engineers—closely guarded secrets during development—we can, without this knowledge, provide refinements of line and features which can reasonably be expected.

The "Fork" Truck

You will note that the area forward of the mast of the industrial truck is left to the imagination.



PLUNGING front gives visibility to carrier.

That is as it should be. Tomorrow's truck will be bought for a definite task, or group of related tasks, in which forks—as we know them today—may not be applicable. Material may be raised and carried by fingers, by suction, by magnet, by grip or by hook.

Here are other features around which this model was designed.

Ease of entering and leaving the seat is provided by the low overall height, which results from a flatter engine—a definite, current trend. This will also permit a lower center of gravity.

Extremely compact and rounded, the body permits easy maneuvering. The backward, sloping side of the counterweight suggests ease of entry. Engine cooling is via functional, circular air-intakes.

Controls have features reminding one of an aircraft. The steering wheel slides horizontally. The first notch on the back movement tilts the "forks" and the booms; the next notch to the rear controls elevation of the load. In full back position, the load is securely locked for transport. This system allows the operator to use controls by feel; he doesn't have to look for them at any time. It also provides an extremely clean front design and excellent forward vision. Load controls (with overload warning lights and/or sound devices) are mounted between the booms.

The pedestal houses the instruments and controls for side-shifting, rotating, front dumping, or whatever other action is desired. Below the dials is the combination

(Continued on page 164)

Do Not Tear!
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WITHOUT MATERIAL FLOW

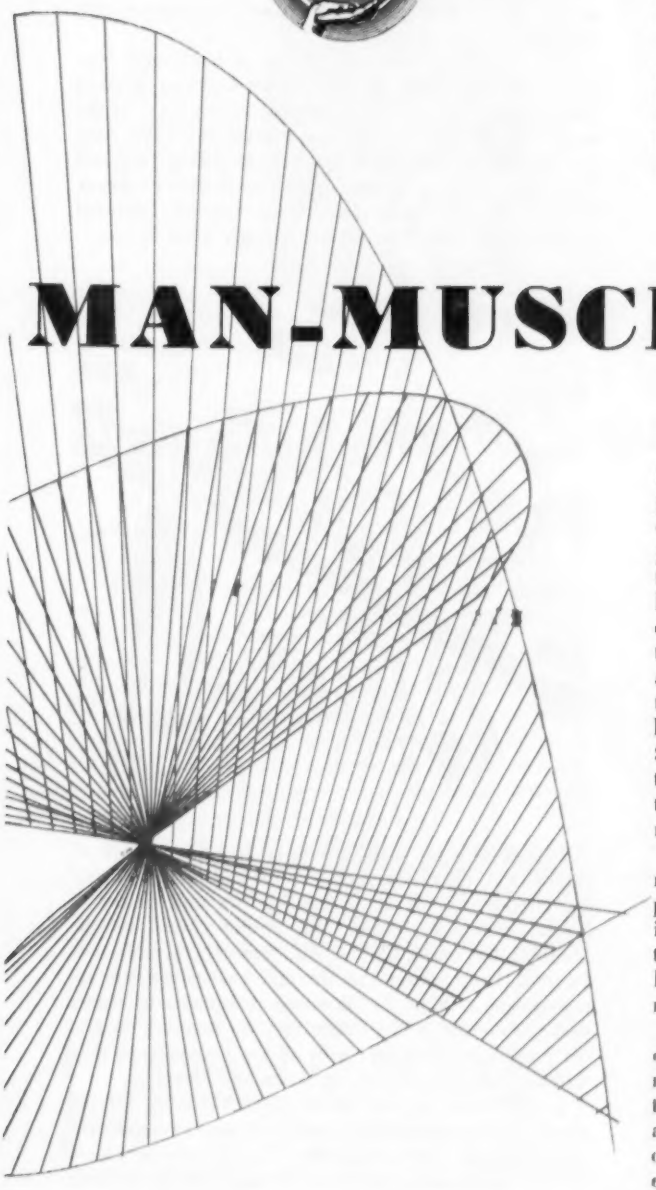
AMERICANS ARE CLOSE TO AN ERA OF MINIMUM PHYSICAL EFFORT, GREATER PRODUCTIVITY AND MAXIMUM SAFETY.

R. C. SOLLENBERGER, Executive Vice President of the Conveyor Equipment Mfrs. Assoc., had his early experiences as a Material Handling Engineer and a Conveyor Engineer. On the War Production Board, he was Chief of the Conveyor Section and Deputy Chief of the Material and Mechanical Power Transmission Handling Equipment Branch.

AS A NATION we are well into an era of effortless labor, following a trend in which our mechanical muscles breed still more mechanical muscles. Physical effort without pleasure (except under orders from the doctor) seems well on the way toward oblivion.

About the only area where real drudgery still exists is in the field of material handling—and who wants to be a drudge if he can command mechanical muscles to do the job for him? Human laziness is much more likely to have been the "mother of invention" than was old Dame Necessity.

MAN-MUSCLES



In a recent U. S. Department of Labor Survey we find that the term, "laborer," was replaced by the phrase, "laborers, material handling," a further indication that this is the major remaining labor area employing muscle-power. An idea of how much it costs to generate power is a matter of simple arithmetic based on the assumption that an able-bodied workman can generate about one-tenth horsepower. According to the survey, material handling labor rates ran from a low of $1.17 to $1.81 an hour with a median of more than $1.50. On this median basis, one horse-power hour generated through muscular effort would cost $15.00 as compared with one horse-power hour of electric energy available at 3 cents or less—a ratio of 500 to 1. According to a friend of mine in England, the ratio there is 480 to 1.

There is no question but that the American workman generally is heading into an era of minimum physical effort, greater productivity, higher spendable income, and more leisure time. In no field will that trend be greater than in that of material movement. In saying, "material movement," I include the movement of bulk materials, things, and people themselves.

Along with all these will be greater safety for anyone who has to be around machinery. With the automatic controls and safety devices available even now, there is little reason for anyone to go into hazardous areas. Remote control devices are simple, sure, and coming down in cost. A conveyor can carry its own eyes through closed-circuit television to report back to an operator exactly what is going on at the discharge point. If necessary, it can carry its own ears to relay audible information to a remote control point. And it doesn't take much imagination to see one with its own nose to report on changing smells in a process. A mechanical tongue, complete with "taste buds", could be devised to report something that might go wrong in a processing operation on food or drink. (This might

(More on next page)

lead to the formation of a Machinery Division of Alcoholics Anonymous if some limits were not built into the tasting process.)

The farther we get into the Atomic Age, the more hazardous are materials which must be handled. This makes development of remote controls imperative. These developments will be extended to handling materials of less hazardous nature and even to those merely unpleasant to be around.

Through all of these developments runs the principle of continuous and controlled flow of materials applied to existing industries and to others of which no one even dreams yet. One area in which whole new industries will develop is in what I would call, "leisure time industries"—the sole purpose of which will be to cater to the people with time on their hands and with energy unspent during their work days. The growth trend in amateur arts, in participation sports, after-hours education, travel, and entertainment is well established. The do-it-yourself trend is only partially accounted for by high hourly service labor rates. The biggest boost to that trend comes from the satisfaction of working unspent energy in producing something for yourself. The manufacture of do-it-yourself tools and equipment is a big business bound to grow bigger.

Conveyors are, of course, an important part of all these trends for they are the mechanical embodiment of the principle of flow-production—the heart of mass-production methods. When you consider that there are nearly 90 distinct types of conveyors in use today, it seems unlikely that there will be many brand new designs advanced although there will be no end of the adaptations that will be made of the kinds now in use.

There will be refinement in design of the accepted forms of conveyors. Refinement which will mean longer life, less maintenance, lower operating costs, fool-proof safety devices, precise and integrated control equipment—and better styling as buildings merely for the sake of protection from the weather vanish before processing equipment and machinery carrying its own protection from the elements.

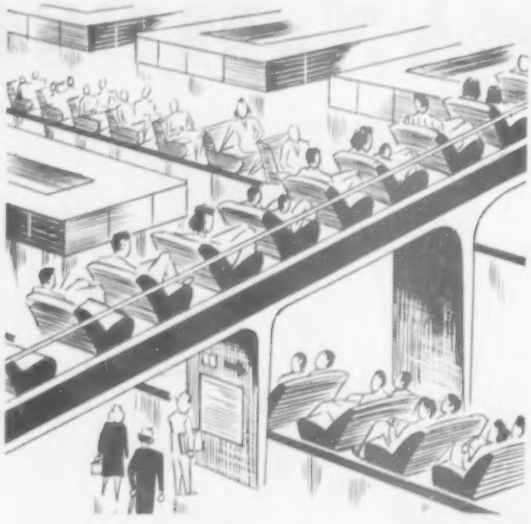
More Application Engineering

The big change for the conveyor industry will come in the expansion of application engineering rather than in design changes. A large part of this change will come about as a matter of economic necessity brought about by competitive struggles in the many industries where there will be no room left for the inefficient, high-cost producer.

In almost any city one can name, people have been piled on top of people 20, 30, 40 or even 100 deep, and yet all movement in and out takes place on a single level—except for a minority of cities where two level transportation is used. Modern transportation in many areas is actually slower than it was with the horse and buggy. This is no far-fetched comparison.

Unhappily, there is no panacea that can be applied to produce magic results, but I believe that there are just as many advantages to be gained from applying the principles of continuous-flow movement to the urban transportation of people and the things they need as are found throughout mechanized commerce and industry.

The passenger conveyor is old. A horizontal conveyor was operating in 1893 at the Chicago World's Fair and the first vertical conveyor in the form of the manlift appeared in 1887. Two moving sidewalks went into operation during the past year in Jersey City and Houston. Inside of three years the shuttle conveyor between Times Square and Grand Central Terminal in New York will be running beneath 42nd Street.



Design of such installations is an odd mixture of mechanical, electrical, architectural and civil engineering stirred in with all of the oddities and quirks of human nature en masse. But public nature accepts breaking the sound barrier with equinamity and looks forward to cracking the thermal barrier as we approach space flight. So, it seems reasonable to expect that commuters of the future may be stepping on and off passenger conveyors with all the nonchalance they now display toward moving stairs and elevators.

It isn't hard to out-Verne Jules Verne in talking about developments of the future. Even now passenger conveyors are being suggested for all sorts of places to end pedestrian congestion. Perhaps fringe parking lots with continuous transportation to downtown areas provided by conveyors protected from the weather are to be expected. It seems evident that the generally unsatisfactory and costly conventional bus transportation downtown has killed off fringe parking wherever tried.

Such conveyors can be underground or they may soar several stories into the air, crossing high above street level from building to building over lightly con-

(Continued on page 154)

DAVE BECK, Gen. President, Internat'l. Brotherhood of Teamsters, Chauffers, Warehousemen & Helpers, gives his views on effects of increasing mechanization.

Handling Equipment . . . *Servant of Labor*

THE International Brotherhood of Teamsters Union believes in reality, and it believes in facing facts. It also believes that progress can only be made by going forward. It is for these reasons that we accept the inevitability of automatic material handling and also of all other forms of automation.

We stand now on the threshold of the Second Industrial Revolution. It can be a nightmare or a blessing, not only to the working man but also to the consumer and management and the country as a whole. We must learn from the mistakes of the past.

The endorsement of a philosophy of progress is what has made America great. In the past 25 years, more than 20 million jobs have been created in this country because the American workers and their unions have not only accepted but also developed new ways of doing things.

> *"The Teamsters also realize . . . more efficient ways of doing things . . . mean higher wages for themselves . . ."*

One small example in our own union concerns the development of the vending machine. This mechanical salesman now handles almost any product. Instead of fighting the development of this device, the Teamsters have worked along with its expansion because they know the more places a product is displayed the more of it will be sold.

The Teamsters also realize that more efficient ways of doing things mean higher wages for themselves. For example, one manufacturer in Chicago, with *whom* we have a *contract*, recently built a very expensive warehouse—using automation—and ended up with more employees than before, primarily due to the greater volume of business he was able to handle.

A Minneapolis company, where we had 50 people under contract in the warehouse ten years ago, now has more than 150 people doing the same type of work as a result of an increase in business after installation of automatic handling machinery.

Another good point from the viewpoint of the worker who does a routine and boring job is that he will be relieved to do more interesting work.

However, we must be careful that we do not relieve too many people from their jobs without providing new positions for them. It is all very well for scientists and economists to talk glibly of "temporary dislocations by automation," but to the worker who is affected it simply means that he is out of a job.

We have, for instance, a warehouse in an eastern city now doing twice the business it did 15 years ago with 100 fewer workers.

When this happens, fewer men produce more things—we are planting the seeds of economic instability from which a depression can spring.

Stories in business journals which emphasize the number of employees displaced by automatic machines always make me uneasy. It is all very well to get a steam shovel to do the work of a hundred men, but unless jobs are found for those men we will wind up with nothing but an economic hole in the ground.

While many members of the Teamsters' Union do not have to fear the inroads of automation because they

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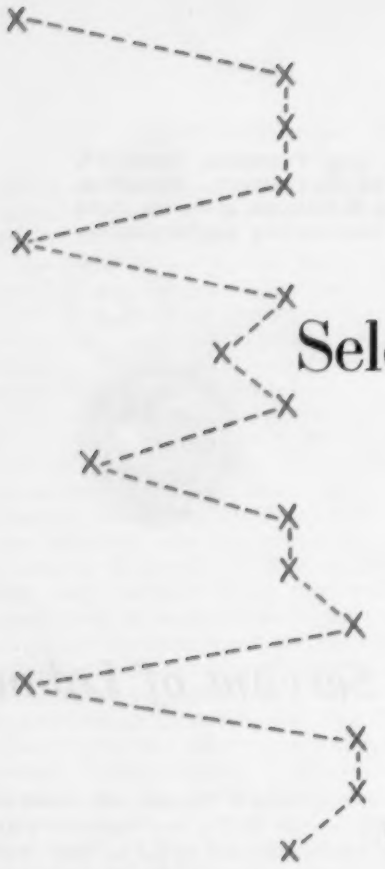

Selective Employment . . . By-Product of the "Automatic Age"

By Joseph E. King, Ph. D.

LONG-RANGE implications for company management in personnel administration become apparent after reviewing population statistics which report that, between 1955 and 1975, 20 million new jobs will be needed to take care of the potential labor force. Added to this factor are the new industrial revolutions in electronic controls and material handling, plus the current unemployment estimates for this year.

According to the U. S. Bureau of Census, the country's present population is 163.9 million, and predictions are for a population of 221 million by 1975. Thus, it is no longer the Malthus question of whether supply of goods can keep up with population demand, but whether the number of jobs can keep up with job applicants. Today, there are 65 million employed or seeking employment; in 1975, there will be close to 85 million. The potential work force is definitely growing, and the question is whether jobs will grow in the same ratio.

Add to this increase in potential employees the new age of automation. Machines replaced the worker's muscles in the first industrial revolution, and the electronic revolution might well see the machine replacing the worker's brain, in both office and factory. Whether, like Industrial Revolution I, automation will increase productivity and create new jobs in building and maintaining new machines, or whether it will add to the labor market, is still a moot question.

Unemployment figures for January, 1955, were 3.3 million—about 200,000 more than January, 1954. Estimated mid-1955 unemployment is 4 million plus, compared to 3.3 million in 1954. Not all these people will be looking for work, since some will have been temporarily laid off and others will be drawing unemployment compensation. Many women, oldsters and youngsters will have simply disappeared from the labor force. Added to unemployment *per se* will be the fact that many companies will pare overtime, cut extra shifts, institute shorter working hours. Incidentally, these unemployment estimates for 1955 are not related to the population growth, since the entry of war-postwar babies into the labor market will not occur until 1960. And, automation is still in its infancy.

DR. KING is president of Industrial Psychology, Inc., Tucson, a national psychological research group. This organization, through research studies in business and industry, develops personnel tests and other scientific techniques for evaluation of personnel.

What do these figures mean for company management as interpreted in terms of better personnel administration?

One implication is that companies will have a greater selection of applicants starting in 1955, with a spurt in 1960, and a large labor supply in the 1970's. A number of studies have pointed to a relation between the selective ratio and efficient employees. For example, if four assembly workers are needed, and you must choose from six applicants, your chances of picking efficient producers are much less than if 20 applicants appear.

World War II selection-efficiency figures were fairly self-evident on this point. From 1946 to 1954, companies faced an employee-oriented labor market, and were unable to take advantage of the newer techniques of manpower utilization. These new 1955 variables, however, add up to more applicant availability in various job categories, and the opportunity for management to hire with more caution and to do some needed culling in present work forces.

Many Workers Now Sub-Standard

The present work force is the second implication in the labor market trend. Studies indicate that from 10 to 30 percent of a typical company's present employees are performing below standard—justifying even the union's criterion for discharge-for-cause. When checked out for psychological ability to do their work, these employees generally lack the basic traits to perform any better. And, management needs to realize that these employees will not suddenly develop efficient skills.

For trimming efficiency in company operation, there is no better place to start than the present employee category. Personnel costs have been found to range from 40 to 75 percent of the operating budget of a company and, in the average product or sale, labor cost is three times the material cost. Turnover figures show that it costs a minimum of $300 to hire, train and then lose a rank-and-file clerical or factory worker. This is a basic investment in the employee, and does not ininclude replacement cost, employment compensation cost, slow-down in production, etc.

During his working lifetime, an employee will be paid an average of $100,000 in direct wages, welfare and retirement benefits. Further, fringe benefits now cost American business 43 cents extra per productive hour, and are predicted to increase another 40 cents in the next decade. Such figures indicate that it pays to make the right predictions in the hiring steps.

Marginal Workers Cut Profits

With marginal performers, the company is fortunate if it breaks even, when the worker's productivity is balanced against his wages plus overhead. Also, in light of the present labor market predictions, management may be doing these employees more of a favor in 1955 than they realize—in the 1960's such employables may find job-hunting difficult.

Since 1941, companies have not been in a favorable position to utilize scientific personnel techniques. While tools have been available for prediction and control of employee performance, most companies have hesitated to use them. They have hired applicants without regard to their psychological potential for the job, obtaining a large number of hands but not necessarily efficient workers.

Much training money has been spent on new employees who lacked the basic aptitudes even to learn assignments, much less perform them efficiently after training. Many workers whose performance was substandard were retained on the job, since replacements were hard to find. The duties of the personnel director

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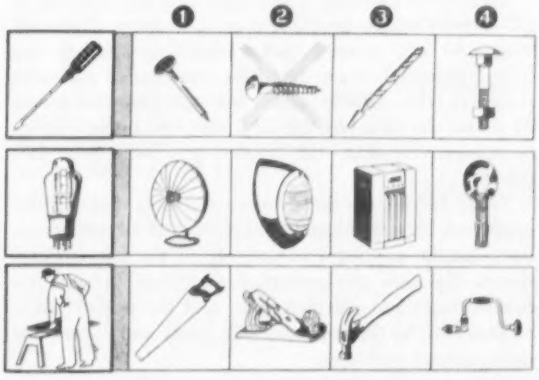
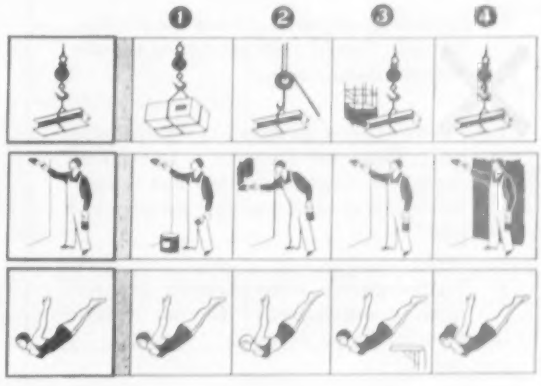


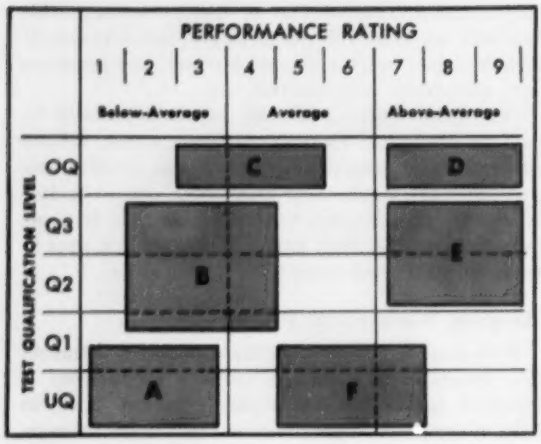
MECHANICAL APTITUDE TEST shows applicant's ability to comprehend types of mechanical information. Which picture belongs with the one at left?



DETAIL PERCEPTION TEST shows the applicant's ability to see details, important for inspection. Either 1, 2, 3 or 4 exactly matches picture on left.

". . . a different type . . . is needed in the automated office or factory . . ."

Relation of Psychological Qualifications and Performance Scores



A—*Psychologically underqualified and poor performers*: Demotion or discharge recommended. Check psychological qualifications for other company jobs prior to severance.

B—*Psychologically qualified, but under-performing*: Investigate causes by checking strong-weak points in test qualification and performance part-scores, and external factors. On basis of analysis, recommend reassignment, transfer, discharge.

C—*Psychologically overqualified, and underperforming*: Give special assignments but no status increase.

D—*Psychologically overqualified but performing well*: Consider for promotion to more difficult assignments.

E—*Psychologically qualified, and performing well*: These are company's best placed employees. Give recognition and reward. Promotion pool, if qualified for advanced job.

F—*Psychologically underqualified, but performing satisfactorily*: Do not disturb, but also do not promote.

PERSONNEL INVENTORY-AUDIT results have been charted to rate each employee as to job efficiency and his psychological qualification for his job.

were often record-keeping in nature, rather than those of his proper role of personnel administrator.

The present loosening of the labor market will allow companies to sharpen their methods of employee selection. No longer is it necessary to hire the first applicant who appears. Studies show that if the company has three job openings in the junior clerk or semi-skilled worker area, a minimum of ten applicants should be screened before any hiring decisions are made.

Automation Changing Requirements

Screening of from four to eight workers for each job opening in the company is a good rule of thumb. Management should also keep in mind that a different type of employee is needed in the automated office or factory, and automation is changing job specifications. The semi-skilled worker was a product of Industrial Revolution I—he may be replaced by the machine in the age of automation.

The next question is whether companies are prepared to pick the potentially efficient worker from the four to eight applicants who will be recruited for each job opening. Here is where the applied research studies of industrial psychologists and management engineers in the past ten years will bear fruit, since these studies have produced a number of systematic and objective personnel evaluation tools. The job applicant or present employee can now be looked at in terms of four psycho-personnel areas to gauge his probable efficiency on the job.

The Psycho-Personnel Areas

Biography Background. New developments have occurred in the application blank and in interviewing methods. The trend is toward the weighted application blank, which consists of a form with more than 100 questions. The applicant has a choice of four answers to each question, and he selects the one which best fits him.

Each of the answers is weighted, and on the basis of his answers he gets a weighted score in terms of overall biography and in such background fields as job stability, financial maturity, job experience, domestic situation. The skilled worker, for example, who scores 29 points out of a possible 224 points is a greater risk biographically than the applicant who scores 197 points.

Thus, before the interviewer starts to talk to the applicant, he arms himself with facts and figures which compare the applicant objectively to the job requirements. He uses the *patterned interview* to pick up further facts and clarifications; and the *non-directive interview* to let the applicant talk freely and discuss his occupational problems.

This systematic and objective approach replaces the old-type application blank and chatty interview, which are no longer sufficient to ferret out the applicants who will develop into efficient employees. The interviewer

tends to be less biased in his judgment, less prone to be emotionally influenced by the face-to-face discussion with the applicant, less prone to believe the applicant in terms of his saying what he can do versus what he has actually done, less prone to type the applicant on the basis of some physical characteristic, less prone to let one good or bad characteristic overshadow other pertinent traits of the applicant, less prone to think that the applicant should fit a mental stereotype which the interviewer may associate with this job, less prone to matching men and prejudices rather than men and jobs.

Aptitudes. The applicant's aptitudes indicate his brainpower to learn and perform a certain job in business and industry. Regardless of his interests, personality or background, the applicant's performance eventually gets back to his aptitudes. The old idea of the I.Q. as the main determiner of intelligence has been replaced by the eight aptitude factors, and these factors have been studied in relation to successful and unsuccessful workers in the major job areas.

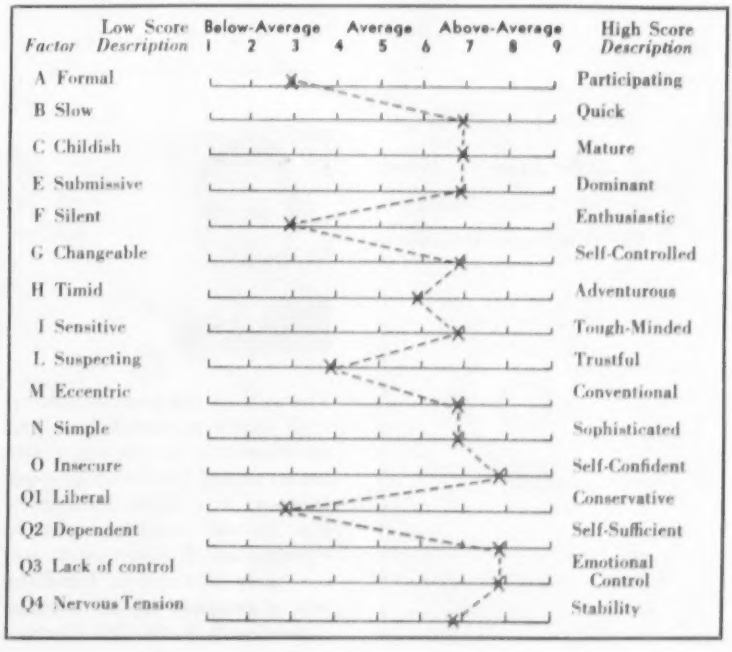
Aptitude Tests a Necessity

These aptitudes range all the way from comprehension of various types of business or industrial information to eye-hand coordination. Aptitude tests are a necessary complement to the application blank and interview data, since they generally measure traits which cannot be determined by a face-to-face discussion with the applicant. The interviewer is yet to be found who can spot good or poor perception in a clerical applicant, motor coordination in a factory applicant, or logical reasoning and organization in a technical or supervisor applicant.

Personality. New advances are being made in measuring the intangible traits of personality by paper-and-pencil tests which can be administered and interpreted in the company. There are short, 5-minute tests to gauge the applicant's general stability to adjust to a job, his adaptability to inside versus contact jobs, etc. At the higher job levels, a full profile of the sixteen basic personality factors can be drawn to spot such intangibles as drive, initiative, leadership, etc.

Merit Rating. Once hired, the applicant should not be forgotten, but rather followed by the personnel experts closely. System and objectivity also have been introduced into merit rating; and this is one of the best methods for maintaining contact with both the applicant's job efficiency, and his satisfaction and morale on the job. Newer performance rating tools have removed the supervisor bias, and produced a rating which has implication both for personnel administration and for overall company management.

Since the labor market and automation barometers are beginning to point to a decade of more personnel availability, company management can well start organizing and operating a scientific personnel program in 1955, which by 1960 will show results in the profit-loss structure, and also on the general mental health of the work force.



DESIRABLE PROFILE of skilled worker on the 16 basic personality factors is shown on the chart at right. The skilled-worker applicant who deviates too far from this pattern may have personality tendencies which will conflict with the job demands. The age of automation will set up many new personality job requirement factors.

Plant Organization and Personnel Training

. . . to meet production demands of tomorrow

By John G. Hurd,
Project Manager,
The Emerson Engineers

The author has been in contact with many material handling problems in the paper, petroleum, metal fabricating, steel, lumber, and glass industries. His formal training was in Production Management, and his early interest in handling was a product of an association with Gulf Oil Corp.

PROGRESS in material handling will closely parallel that in the maintenance and repair function.

Not until management could visualize potential dividends from the items, "Maintenance and Repairs", on profit-and-loss statements were they willing to spend the funds and time to establish the controls and methods to bring this cost item into line. There is still much to be done. But the relative ease with which costs have been turned into profits by the proper objective and analytical approach has proven to management that the "necessary evils" are worthy of attention.

Unfortunately, material handling, as such, does not appear on profit and loss statements. Nevertheless, justification for its improvement is no longer an insurmountable obstacle.

Two Governing Factors

There are two factors which seem to govern the rate of growth and assimilation of material handling techniques: first, the amount of research and development conducted and observed; and, second, the provisions made within the organizational structure to utilize the newly developed techniques and methods.

The research and development factor varies in degrees—from formal engineering and laboratory development to the informal, unannounced daily method changes made by supervision and the hourly employee. As yet there are too few places where improvement of material handling is an integrated function. This bears directly on the second factor, concerning organizational provisions.

Today, "Manager of Material Handling" (or equivalent) does not appear as a title on very many organization charts. The duties such a title would encompass are currently being "shared" by a number of other supervisors. And the old adage, a divided responsibility is no one's responsibility, certainly fits aptly.

Eventually this position will be filled on more and more organization charts. But what will the job require from the individual hold-

ing it? First of all, it will be necessary for him to be able to keep his eyes on the "big picture"—the whole design, engineering, purchasing, production and distribution cycle. If there is a better means of movement anywhere along this cycle he (and his staff) will be expected to develop.

Large Quantities Ideal

Currently, the ideal product for the application of automation is the one produced in large quantities with infrequent design changes. To veer from this course now meets with cries of prohibitive costs, but by 1965 this will not be so. The further application of automation to products produced in smaller volumes, and those subject to frequent design change, will have overcome, to a large degree, the prohibitive cost barrier. Hope in this direction is given by the rapid trend toward flexibility of machinery and material handling equipment—flexibility not only in use but also in movement from place to place as the production picture changes. The use of light strong alloys is partially responsible for this, along with the visionary thinking being done by engineering.

The need for further training in the design and application of this flexible material handling equipment will go all the way back to our educational system. By 1965 it will be more fully treating the science of material handling and automation in its curriculum. Only a relatively few universities have yet made available courses which deal particularly with the indoctrination of material handling principles. The void has been noticed, however, and more courses are constantly being developed.

The trend in the application of more engineering talent to the design of automated machinery and material handling equipment has already been well started. But, to a large extent, the training of skilled technicians to service this new equipment is being overlooked. The current tendency to shift emphasis from production worker to maintenance worker will continue. But the role of "observer-technician" is going to require a more highly trained person than is now to be found in most production operations.

All known techniques, including the latest in visual education and communication, will be employed to help current employees acquire the knowledge and skills necessary to run tomorrow's machines and processes. The transition period will be gradually accelerated for the next few years.

The use of television monitors in batteries for supervision, as well as inspection and instruction, will be a realization. Easily moved cameras and two-way communications will make difficult repairs of

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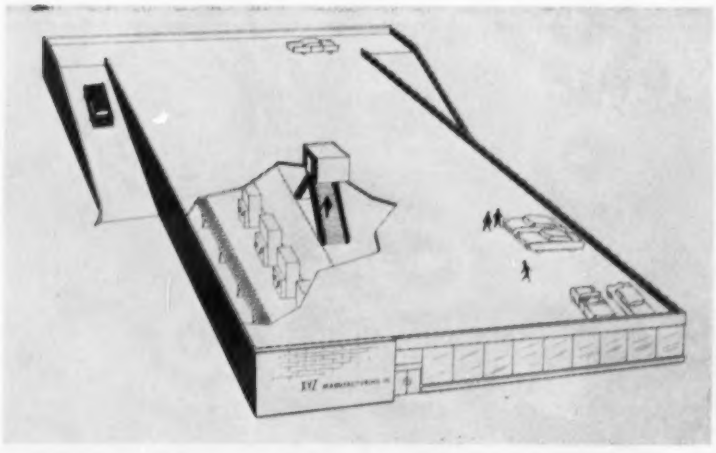


PLANT construction will be even more influenced in the future than now by plans for material handling and personal comforts.

DURING TRANSITION period, industrial TV will help train maintenance personnel, as sequence shows: 1. Jam occurs when press breaks down. 2. TV man arrives, plugs into available video and audio circuits. 3. Maintenance and electronic men at monitors direct repair.

Sketches courtesy Diamond Power Specialty Corporation.

How Industrial Management Can Utilize TV

By R. S. Yeandle

CURIOSITY of man has, since the beginning of time, provoked his desire to observe activities occurring at distant locations in order to better understand life, people and a host of phenomena. Truly the adage, "a picture is worth a thousand words", demonstrates the percipient capabilities of the human eye and this attribute has predominated all others in our search for knowledge, and it will be whetted by the application of new tools and devices which will bring information to us with no more effort than a touch of a button.

Although electricity and the automobile have had outstanding effects on our living habits, more recently television has contributed its share in changes to our living habits. The phenomenal growth of this industry in the past several years causes us to reflect: where shall it end? Obviously it never shall, and while we consider it primarily as an entertainment medium today, the real impact has not yet been felt.

Where else do we have a device which will bring foreign lands and people into our living rooms; allow a military general to see the activities of his men and

". . . conference television . . . personal contact with an entire sales force economically . . ."

those of the enemy so that he may take advantage of any opportunity; allow doctors and scientists to observe laboratory experiments taking place in distant cities? All of these applications and many others will serve to satisfy our quest for information.

Educational Television

Our concept of educational television as it exists today is largely one of vocational training in the home. However, it will be essential to develop techniques for effective teaching by the medium of television. Additionally, it may be more advantageous to distribute such programs by wire line facilities or microwave, rather than by a television station. This method of distribution to a private audience is known as "Closed Circuit Television".

In the application of television in this area to date, its use as a training facility is perhaps the most common. In the field of medicine, several hospitals are currently equipped so that critical surgical operations may be displayed in large screen color to groups of medical students and doctors. And now the application of telemicroscopy is taking form. Whether it be in a medical or industrial laboratory, in black-and-white or color, closed circuit television provides a means of showing the magnified images to many people simultaneously and in various picture sizes. Important also is its ability in the reduction of operator fatigue for those who must squint into a microscope for long periods of time.

The monochrome applications are wide and varied, with some of the more logical being signature identification, inspection of hazardous operations ordinarily dangerous to a nearby observer, surveillance, traffic control and the like. Certainly other applications are no less important, yet relatively little impact has been made on industry as a whole. In spite of this, it is expected that the use of television and television techniques will play a tremendous part in the future growth of industry in its application to industrial processes.

Consider for the moment a television system in your plant whereby you or your engineers or production men may dial a drawing number and within seconds it appears in large scale form at one or many locations. Dial the same number with the prefix ML, for instance, and an exact reproduction of the material list appears. Extending this application into other areas, we think of stock records, maps, graphs, files and the like. In fact, any system of records may be designed to permit this distribution and if a permanent reproduction is required at the receiving point, this may be accomplished automatically in seconds as the desired information appears.

Inspection Easy for TV

Inspection processes offer intriguing possibilities for television, particularly at high rates of material flow. The split-second glance of a television camera at a manufactured article as it moves along will produce an electrical signal, which, when compared to that of another camera focused on a reference unit, can be used to reject those articles beyond limit. Such a system may be applied to a score of applications in the color, contour, and surface areas of inspection. The contour comparison immediately suggests a form of machinery automation, wherein the differential signal may be used to control the movement of a piece of material throughout an automatic process. At its conclusion, there should be no further inspection necessary because each piece has been copied from a master throughout the operation.

With conveyors thousands of feet in length, television provides continuous observation of operating conditions at the far end. Even more fascinating are the multi-section conveyors carrying ore over many miles. Such installations contain many changes in angular direction which, of necessity, occur at section junctions. Because of the possibility of material pile-up or spillage at such points, they must be constantly watched

(Continued on page 231)

". . . one operator controls traffic movement . . ."

ABOUT THE AUTHORS . . .

R. S. YEANDLE, author of the first half of this two-part article, is with General Electric Company, Industrial Electronics, Syracuse.

HAROLD E. ENNES, contributor of the two pages following, is systems engineer, Dage Television Division, Thompson Products, Inc.

Television Supervises Tomorrow's Handling Systems

By Harold E. Ennes

THE technical world, like water, cannot stand still without stagnation. Every new idea or new product is immediately scrutinized, analyzed, compared and tested for evaluation in its own or allied fields. The momentum of the rapid advances in this world of technology keeps on gathering speed from its own weight of existence. Thus, it is not surprising that radical ideas evolve so rapidly into fundamental laws.

The TV camera is already doing many important jobs that cannot be conveniently accomplished by any other method. The camera eye can be positioned in spots where the size or weight factor, or safety reasons, preclude the presence of a person.

In the field of material handling, the growing incorporation of automation will have far-reaching effects in all of industry. In fact, it is inevitable that closed-circuit television, with its convenient extension of human vision, will become an integral part of industry. Within the decade, television cameras not only will overcome the impediment of distance in human vision, but will overcome other impediments to vision as well.

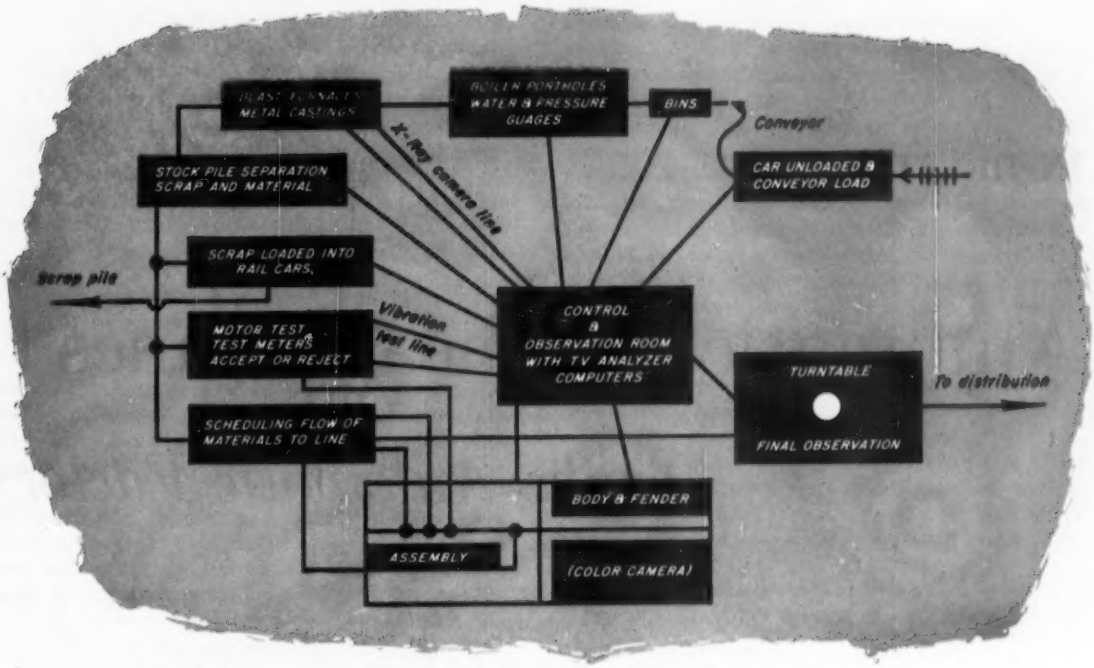
Before looking into the development of the next decade, it is pertinent to review the *present* applications of closed circuit TV in a specific case of material handling. Because of the complexity of operation, an automobile manufacturing plant is a lucid example of the application of automation. This idea would have been "radical" ten years ago.

A master control and observation room centralizes all remote controls, visual monitors and waveform monitors. TV cameras employed are conventional monochrome (black and white), a color camera for the body and fender assembly block; an X-Ray camera for the casting room; and a vibration test pickup to feed a special waveform monitor in the control room. Cameras are not only used for important centralized operations involving direct observation, but also are used for quality control and actual test analysis.

Start of the Operation

The operation starts with fuel cars being unloaded, material transferred to the conveyor, then carried to the storage bin. All operations are performed from the control room by direct observation of the picture monitors. From here the fuel is carried to the boiler room. Cameras peer through boiler portholes and view oil fired burners, coal injectors and the flame as it appears when pulverized coal is injected. A color camera is an

". . . all operations performed from control room by direct observation . . ."



SCHEDULING flow of materials through an entire plant from one central point.

important tool in this application, since the color of the flame immediately clues any improper mixture which might lead to an explosive condition. Regular monochrome cameras continually monitor the group of gauges indicating water levels and boiler pressures.

Continuing to the blast furnace room where metal castings are made, two types of cameras are employed: (1) the observation camera and (2) the X-Ray camera. Castings are usually tested for flaws by the X-Ray process. The camera employs a special TV pickup tube which replaces the X-Ray film used in conventional X-Ray cameras. In one instance, the camera observes a fluorescent screen excited by the X-Ray scanner. Material may be accepted or rejected from the central control room.

Remotely Controlled Stock Pile

Channeling of the stock pile is also remotely observed and controlled. Scrap is loaded into rail cars and carried to the scrap pile, and stock is carried directly to the scheduling room.

Scheduling the flow of materials to the production line is the next phase. This scheduling is coordinated with observation of the actual production run and fed as needed; all from the master control center.

The motor test room in this example can employ, if desirable, only one person to place the motors and properly attach the test contacts. Observation of all test meters enables analysis from the master control point. Even the vibration test is relayed to a special calibrated waveform monitor which can feed a recording graph to record either rejects or acceptances.

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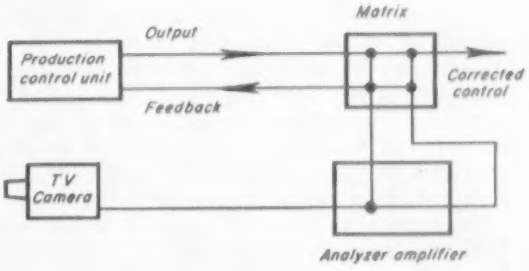
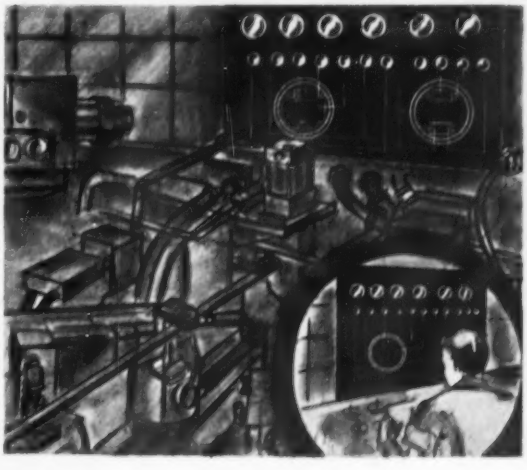


AUTOMATIC CONTROL SYSTEM will have camera which interprets any changes in the gray scale of light as amplitude variations from predetermined standards.



IN DEVELOPMENT . . .

Automatic Overhead Cranes

for the Automatic Factory

By Robert F. Rice

THE overhead crane, with its many fine inherent advantages, will eventually be redesigned to become an integral part of tomorrow's factory, which will demand complete automaticity, flexibility and continuous performance from virtually all equipment. This fact appears inevitable, since the advent of the automatic factory will urge the crane industry into concentrating on those aspects of the crane which presently make it unsuitable for automatic service.

The crane of the future will probably be radio-controlled for automatically completing a cycle initiated by an operator in a remote location. This operator can control several cranes at one time. By feeding data into a small computer, he can set up an automatic cycle which will start the crane, move it over the load to be handled, automatically attach onto and pick up the load, move the load to the desired position, automatically release the load and return the crane to its starting position. At present, there are bucket and magnet cranes accomplishing essentially this type of duty under a fixed cycle. And, the automatic computer will extend this to an infinite variety of cycles.

Mr. Rice is Manager, Crane Department, Whiting Corporation. He takes a realistic stand regarding problems which crane designers must resolve for cranes built in 1965.

Present limitations to automatic operation result mainly from the number of conductors required. However, use of radio-controlled cranes with frequency relay signals to position the crane will eliminate this difficulty.

To enable the remote operator to view the operation of the crane at all times, a closed circuit television system will be used. Television will be particularly valuable for operation of the crane in hazardous areas where the operator might be exposed to excessive heat, poisonous fumes, high voltages or radiation.

The further development of automatic grapples for attaching onto the load—now in general use in atomic energy plants—is progressing rapidly.

Continuous Operation a Must

If the semi-automatic crane is to be economically feasible, it must be in operation almost constantly. Thus, it must be designed so that routine maintenance will not tie it up for long periods of time. Breakdown periods must be eliminated through preventive maintenance, and the time required for replacement of components should be reduced drastically.

Centralized lubrication systems used today have greatly reduced the time required to lubricate all types of machine tools and material handling equipment. In the future crane, sealed bearings and gear units using oils suitable for lifetime lubrication will be even more economical.

Down-time will be reduced by furnishing complete interchangeable units, rather than replacing individual parts. Entire gear units, wheel assemblies, brake-motors, control panels and perhaps even complete trolleys will be made so that they can be removed in a

matter of minutes and promptly replaced with a complete new unit, properly adjusted and ready to go into operation immediately.

The frequency with which these complete units will be changed can be reduced by using better materials which will provide greater allowances for wear of individual parts. The use of new and harder materials now being developed will make possible a much greater increase in the life of component parts and, at the same time, enable the size of the parts to be reduced considerably.

Abuse Will Be Prevented

Semi-automatic operation in itself may be expected to reduce maintenance costs. Much of the crane maintenance performed today is caused by unnecessary abuse by inexperienced or careless operators. With semi-automatic control, abuse of the crane will be prevented.

Consequently, because the automatic crane will not be under the direct guidance of an operator for every movement, extremely accurate control devices will be required. A hoisting control system which is automatically responsive to changes in weight will enable hoisting speeds to remain constant, regardless of the load being handled. Hydraulic control systems will hold a load stationary in the air at any point, lower it with almost microscopic exactness or permit normal hoisting and lowering speeds.

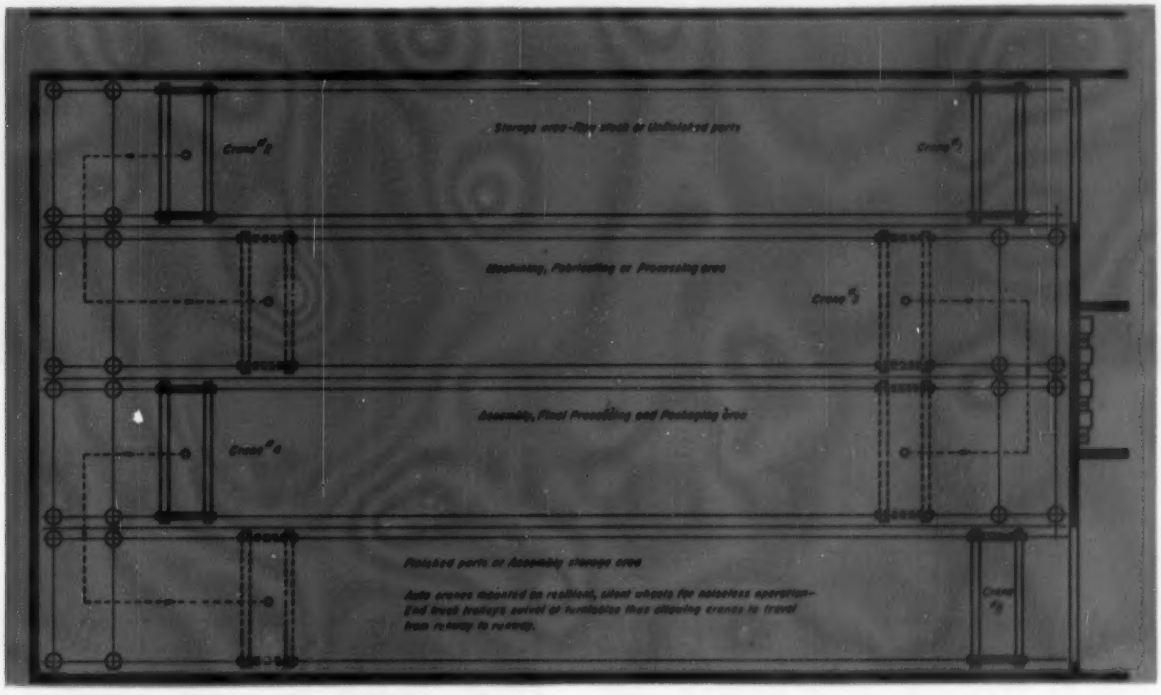
Up to now, all efforts to obtain accurate control of cranes have been concentrated on designing elaborate magnetic control panels or other devices to artificially load the wound rotor motor to take advantage of its variable speed characteristics under full load. This has resulted in control systems where the controls themselves occupy four to five times as much space as the motor they control, and cost four to five times as much.

Tomorrow's crane motor should be designed to provide the required accurate control in the characteristics of the motor itself, and, thereby, eliminate the need for expensive and complicated special control systems which are sources of excessive maintenance.

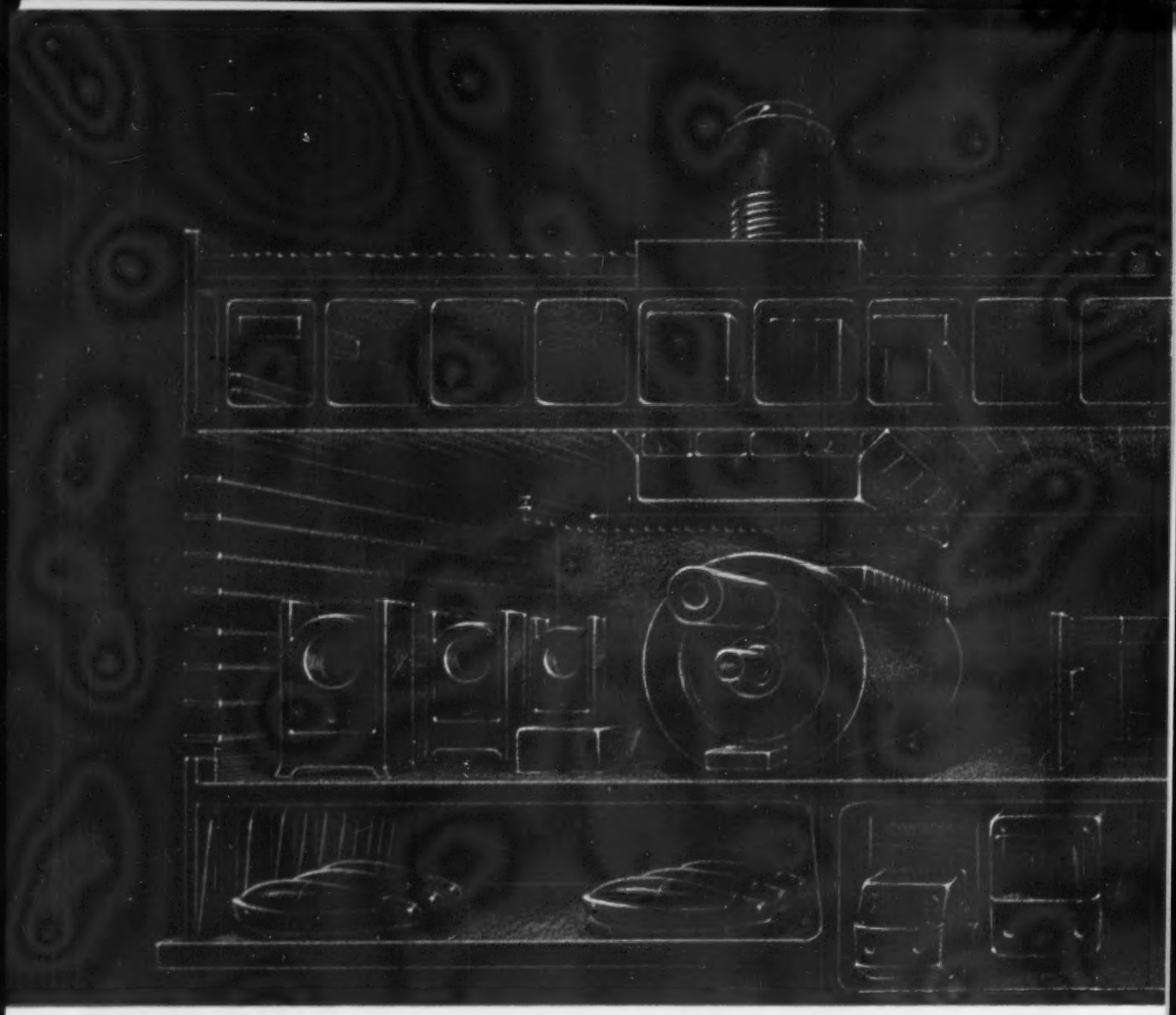
The crane of the future will have higher rates of acceleration and much higher speeds than are used at present. These higher speeds will require greater attention to safety devices, particularly better braking systems.

Of particular importance in the automatic crane is a device to limit the percent of overload which the

(Continued on page 223)



FLOWMATION BY ROBOT CRANES is predicted by Carl Meinardi, Vice-President, The Fred Willyard Company, as he proposes a system whereby overhead cranes can service an entire plant. These cranes would be able to move from bay to bay by means of turntables on the runways and swiveling trolleys. The individual cranes would have no operators—each would be equipped with an electric scanning device which would determine measurements in three dimensions, and each would handle any given type of size material. A clerk would check and write delivery of materials on a telewriter which conveys the information to a control center. A keycontrol card is prepared and placed in an electronic memorizer. To handle materials, the memorizer produces a card, properly indexed, which is given to the control operator. He places it in the proper crane slot, and the crane automatically performs the function of moving material as required.

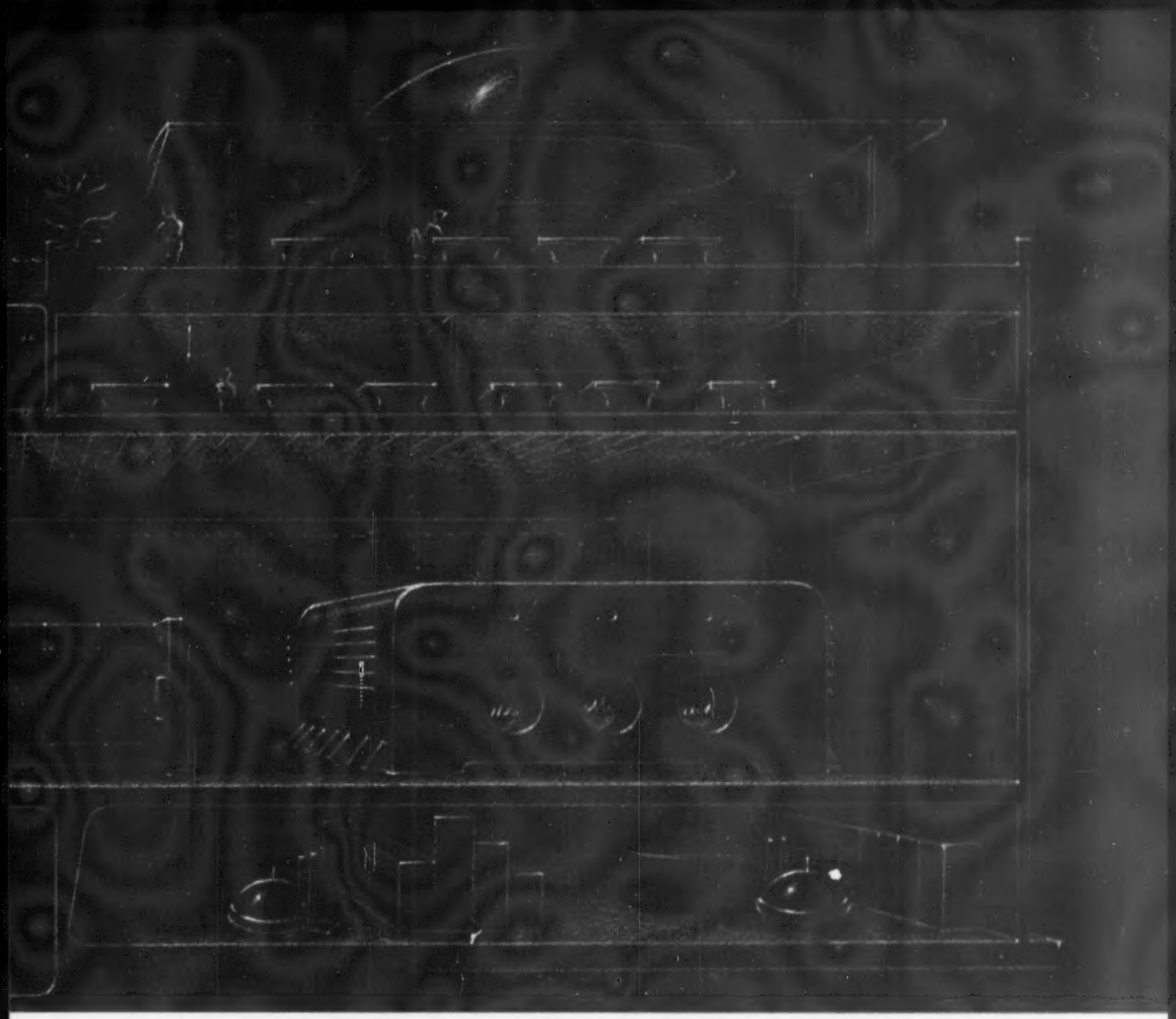


OUT WITH

ANY consideration of industrial buildings of the future must take into account the accelerated trend of developments in recent years. This trend has been away from the typical multiple-story loft or mill-type structure so commonly seen in New England and in most of our older cities. Generally, these structures were heavy brick masonry walls pierced at regular intervals with small wood sash and formed brick arches.

Spans between wood columns were generally from 10 to 16 feet. Floor beams were 6 by 12 inch timbers supported on 10 by 18 inch wood girders with wrought iron hangers. The short spans and low ceilings made excellent supports for line shaft drives but were not conducive to organized material flow. Buildings were generally not more than two or three bays wide. Wings were extended at right angles to the main building when additional space was required.

The resulting inefficiency of long corridors separating narrow work spaces, thoroughly bottlenecked by elevators, could not be worse had the designer deliberately set out to impede the operation. These structures are rapidly being replaced, although some stream-lined products are still being produced in these buildings.



OBSTRUCTIONS!

By Charles E. Annett

As the pace of production increases and one operation is scheduled to tie into another, the need for larger unobstructed areas becomes apparent. Ideal manufacturing space for many operations is a paved level field on a clear sunny morning in the month of May. But, since these days are all too rare, it is necessary to enclose the field with a roof and walls, and to light, heat and air condition the space.

However, the ideal conditions have been approximated to a remarkable degree. Absorption of solar heat and loss of building heating have been reduced through walls and roof by the introduction of insulation and vapor seals. Desired temperatures and humidities are maintained winter and summer by intricately controlled mechanical refrigeration systems. Positive air intake and exhaust systems are provided for human comfort, waste gases, and for temperature and humidity control in processing. Column spacing of 40 feet is usual and 100 feet or more may be provided where justified by certain operations.

Still, production managers are not satisfied. Every column is a mental hazard, if not an actual one. It interferes with material handling equipment and is al-

(More on next page)

OUT WITH OBSTRUCTIONS!

Continued

Charles E. Annett

Mr. Annett is chief project engineer, Ebasco Services Incorporated. His industrial building of 1965 is no wild dream, for, with few exceptions, it could be built today.

ways located where a press should be. Walls prevent expansion for that new department required for the sales manager's next year "sales leader". Less travel from car park to job is demanded. Service piping and bus-ducts interfere with the location of new conveyors. Entire departments must be completely changed for new models. What was designed and built for this year's model may become next year's straight-jacket if too closely tailored to specific uses.

The industrial manufacturing building of 1965 begins to take shape. Approached from the air, it appears to be a well-defined rectangular lake occupying no more than one-tenth of a large green tract. Exit ramps from two superhighways wind down to the basement level of the building, as do several railroad lines. One is struck by the complete absence of parked cars and trucks and the usual array of "out-buildings" in the vicinity of the parent plant. As our heli-cab lands on a small island in the middle of the lake we realize that we are on the roof of the plant. The water is well-stocked with fish and balanced with marine plant life to prevent formation of algae and scum. The air is clear and sweet—we wish we had brought our fly-rod.

Deluxe Air-Conditioning

The smooth surface of the lake is interrupted at regular intervals by monumental towers faced with louvers of striking design. These towers are the core of the unitized air conditioning system, each one serving an area several hundred feet square. All make-up air required for comfort and process is brought in near the base of the towers and completely-filtered, odorless air is exhausted at the top. Hot-process exhaust gases help heat the building in winter and cool it in summer. Recovered solids are an important part of profits. The air conditioning units are completely self-contained, reverse-cycle, air-to-air heat exchangers. They are factory-assembled and shipped to the job in one piece.

We alight onto a moving sidewalk which conveys us down an inclined tunnel through automatically-operated doors to the reception desk on the level below. Immediately upon asking for the manager, a full size image of his secretary appears on a screen before us and her voice tells us to walk through door No. 3 and she will direct us to his office. Upon passing through the door, we are confronted with a choice of two corridors, but are quickly directed to the correct one by the secretary's voice which guides us to our destination.

The first floor below the roof is carried on the lower chord of deep trusses which span well over 100 feet. The space between the chords forms a service galley containing all utility mains, including process steam, power, compressed air, sprinkler, water, gas and duct work. Cat walks extend in all directions to facilitate maintenance and alterations to the utilities and to provide access to the unit power sub-stations which supply an area corresponding to that served by the air conditioning towers. Each area is separated from the next, at this level, by vertical fire curtain walls.

Remote-Control Production

At regular intervals along the corridor, steps lead down to a level depressed several feet below the bottom chord. Here we get our first inspiring view of the vast operating area some 30 feet below. We are struck by the utter lack of noise and motion and wonder if perhaps the plant is shut down. But, on closer inspection, we note the rhythmic motion of the machines and the smooth flow of conveyors. Here and there we find a man maintaining a production unit. The entire operation is largely controlled and supervised from this relatively small vantage point. Here, a dozen or so men and women are constantly checking parts for quality and, by remote control, making necessary adjustments to the machines below. Besides the obvious visual check, there are electrical warning signals which can, in many instances, bring into focus some particularly delicate operation on a large screen at one end of the room.

Further down the corridor over the hub of the operating floor we come to the central office, two stories high. The first floor is level with the bottom chord of trusses, and the second story projects above the main roof to give clear story lighting and a view of the roof patio to the executive office. A huge blue translucent

(Continued on page 224)

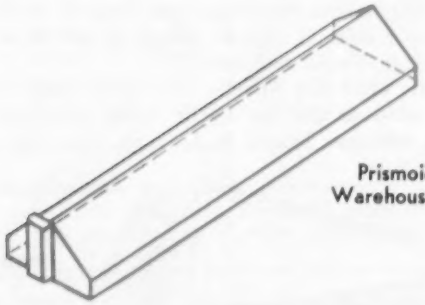
"The industrial manufacturing building of 1965 begins to take shape . . . it appears to be well-defined rectangular lake occupying . . . a green tract."

There'll be some changes made in the . . .

Distribution of Bulk Commodities

HOW will a bulk commodity be handled in 1965? A fairly safe prediction can be made, for significant innovations in bulk handling are in early stages; others are on drawing boards. An evolution is taking place, and it will perhaps be accelerated as the decade progresses.

The writer's most intimate knowledge is of the handling of both raw sugars and refined products. But it seems perfectly conceivable that much of this discussion will apply to a variety of bulk products having similar characteristics.



By 1965, probably 90 percent or more of raw cane sugar will be moved and stored in bulk, as contrasted with the current, established unit packages of 100 to 300 pound burlap bags. Bulk handling will produce important savings by eliminating bag costs, bag handling labor, and bag emptying and reclaiming costs at the refinery as well as at the mills.

In ten years, most large and medium size consumers will have converted to a bulk handling system. Since the economic advantages derived from bulk handling will pressure the smaller consumers, it is likely that there will be further bulk methods developed to take care of their needs.

Several possible forms of bulk handling for smaller users would be:

1. For Dry Refined Product:

- **a.** Pooled deliveries, permitting several consumers to obtain small deliveries of two to six containers at minimum cost.
- **b.** The leased container car, permitting economical shipment of unit containers to points now prohibitively distant.
- **c.** Further development of distribution centers strategically located at considerable distances from sugar refining plants. There are now two on the Pacific Coast and one in the Midwest. By completely mechanized handling—and through the medium of bulk rail cars, storage silos, and local bulk trucks with unit containers—it should be possible to provide almost the same economies to the smaller, remote consumer as are enjoyed by large users and those close to sugar factories. This

(More on next page)

JOHN G. SCHUETTINGER, the author, is Assist. Engineering Mgr., American Molasses Co. and has held positions in methods study, material handling, process development, instrumentation, plant layout and economic analysis.

development will probably have greater impetus in the West and South, less in the East.

d. Ingenious adaptations of common carrier type highway trucks for return haul movements of bulk sugar.

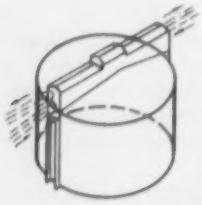
2. For Liquid Product:

Less than tankwagon load deliveries of liquid sugar by means of—

a. Metered deliveries from tank trucks, very much like household fuel oil is now distributed.

b. Unitized containers of 200 to 500 gallons. These will permit a small user to economically buy and handle more than one grade of liquid where his process so demands. Also, in many plants such containers will allow spotting the liquid sugars close to use points and reduce the need for extensive piping installations. They will permit utmost flexibility in operations, along with completely sanitary procedures.

The development of pooled deliveries, leased container cars, and service from distribution centers, as mentioned under Refined Product, will probably also follow for liquid sugars.



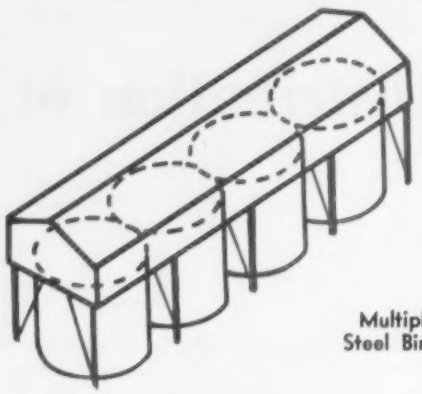
Weibull Type Silo

Methods of handling supplemental sweeteners—such as molasses, corn syrup, and maple sugar—will probably not change much, except perhaps in a few special situations. These are now economically handled by tank barge, bulk rail car, and tank truck, and packaged in drums, pails and bags. Generally speaking, the volumes handled are either too small for special apparatus or are large enough to warrant considerable capital cost for a large scale bulk handling system.

To assist in understanding what is going on, to help justify some of the foregoing predictions, and perhaps to stimulate some new ideas, lets look at the sugar industries as they are now.

To satisfy the current national palate with sweetening agents annually requires over eight million tons of cane and beet sugars and the equivalent of some 900,000 tons of supplemental sweeteners.

Absorption of sugars in the American diet has tended to stabilize at an average of about 95 pounds per person, plus an additional 13 to 14 pounds per person of supplemental sweeteners annually. At present, relatively little sugar disappears into non-food uses. From known facts and official population forecasts it can be estimated that, with a prospective population of about 185 million persons, the annual sugar order for 1965 will be, roughly, 9½ million tons.



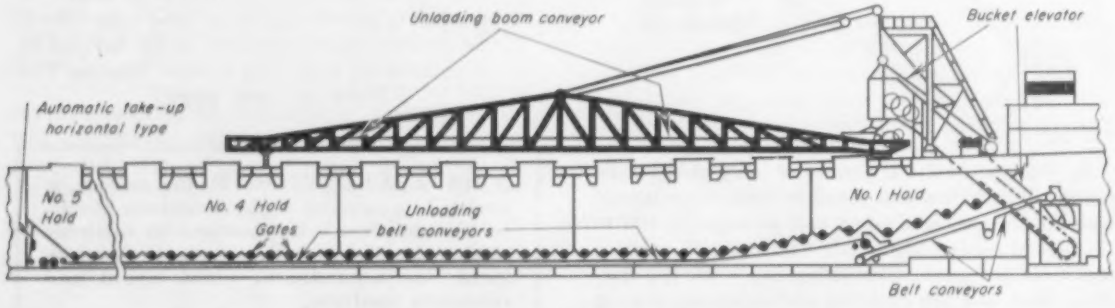
Multiple Steel Bins

In recent years much research has been done on the development of non-food uses for sugar. It is quite possible that some of these uses in chemicals, pharmaceuticals, and the like, will be actively marketed by 1965, adding perhaps another 1 to 2 million tons annually. The overall annual sweetener requirements will then look something like this:

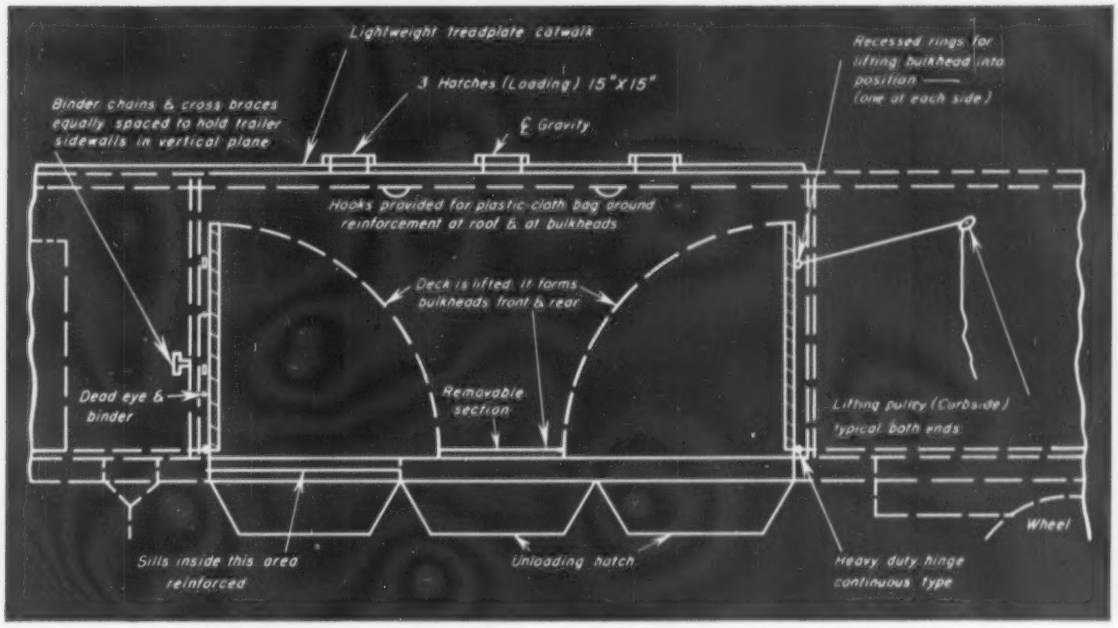
Sugar—(as per current uses)	9,500,000	tons
Sugar—(new product development)	1,000,000	"
Supplementals	1,000,000	"
	11,500,000	"

The American sugar network currently includes about 250 overseas cane sugar mills, some 50 domestic cane sugar mills, 21 domestic refineries, and about 80 domestic beet sugar factories.

Sugars enter five Atlantic Coast ports, eight Gulf Coast locations and one Pacific Coast port, serving the 21 refineries located in 15 cities. With few ex-



MORE bulk will be handled by self-discharging ships like those for ore and coal.


Lightweight treadplate catwalk
3 Hatches (Loading) 15"X15"
Recessed rings for lifting bulkhead into position — (one at each side)
Binder chains & cross braces equally spaced to hold trailer sidewalls in vertical plane
Gravity
Hooks provided for plastic-cloth bag ground reinforcement at roof & at bulkheads
Deck is lifted, it forms bulkheads front & rear
Dead eye & binder
Removable section
Lifting pulley (Curbside) typical both ends
Wheel
Sills inside this area reinforced
Unloading hatch
Heavy duty hinge continuous type

HOPPER-type trailer to help smaller users to obtain economies of bulk handling.

ceptions, cane sugar refineries are located at tidewater to receive sugar directly from seagoing vessels.

The 80 or so domestic beet sugar factories operated by some 18 companies are located in 16 western states. But more than 50 percent of all beet sugar originates in the two states of California and Colorado, with less than 10 percent originating in any one of the others.

From the foregoing can be seen the great distances sugar traverses from farm and plantation to the ultimate consumer. In the course of this travel the products encounter numerous handlings, which add, of course, to the ultimate price. It is within this sphere that the greatest changes in the sugar network probably will occur during the coming 10 years.

Extracting sugar from annual crops, harvesting and milling—in most areas—extends over a period of three to six months. Storage must be provided for uniform annual distribution. Although handling sugar involves more special problems, the situation is the same as for most agricultural products.

> ***"Savings realized in bulk handling . . . include, generally, about 20 cents per 100 pounds, plus other reductions."***

With few exceptions, firms of the industry are now planning or proceeding to install bulk operations. We find that over 75 percent of Hawaiian raws are moved and stored in bulk—and within a few years this will be 100 percent. A few steamer-loading, bulk installations are operating in Puerto Rico—with more planned—so that, within a few years, probably 80 percent or more will be so moved.

Nor is this trend confined to the U. S. Several refineries in England are being equipped for bulk operation, and a fleet of ships is being specially constructed for this trade. A number of partial bulk operations exist in Canada. Within 10 years this mode of handling raw sugar will be quite general throughout most of the world.

Many forms of equipment have been developed for bulk raw sugar operations; new forms will probably evolve. Currently we find two basic forms of storage facility; namely, silos and the prismoid warehouse. Silos have taken two forms—the Hawaiian type of multiple steel bins, open at top, discharging centrally at bottom, with covering head house; and the Weibull type of fully enclosed silo which originated in Sweden. The prismoid warehouse is largely an American development. It is a clear span building with low side walls and peaked roof following the contour of sugar piled on a level floor.

Choice between these types of storage must be predicated on cost and the geography and requirements of each individual plant. The prismoid type bulk warehouse currently appears more favored in the American industry; very likely it will be the form most commonly used here by 1965.

The two basic forms of sugar ship discharge equipment at present are the bucket elevator-conveyor train and grab bucket cranes. Most installations in existence are the former type, where the bucket elevator is attached to a railroad gantry standing on a dock. Grab bucket cranes may be located on a dock or on a waterborne float alongside ship. They discharge bucket loads to hoppers, through which the sugar flows, in a nearly continouus stream, onto belt conveyors.

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DESIGN TO

LOWER TON-MILE COST

By R. W. Butler

OUT of my forty-five years of experience in material handling and control—in all phases—have come some ideas on how a manufacturing plant may operate and what equipment it will use during the next decade.

First, in an acceleration of effort to reduce manufacturing costs, the standards department (or equivalent) must establish standard times for *all* operations. This will require the assignment of competent personnel to make intensive studies in plant layout and operations. If every operation is treated as an individual project and all are coordinated through group discussions and free interchange of information and ideas—if everybody in the plant is given a chance to express his views—important advances are sure to result.

A logical start to such a program would be an accurate plant layout. Equipment required to machine and assemble each component part of the end product should be laid out in scale model or template to obtain maximum compactness, best sequence of operations, and most direct flow lines.

All processing departments will be arranged so that parts are mechanically moved to the main assembly point, starting with the base parts and then in assembly sequence. Mechanical travel of assembly will be proceeded from the material receiving end of the plant to the shipping point, in the most direct line.

The building would then be built or modified to enclose the entire operation, with building shape and appearance secondary to operation value.

The ever increasing use of unit loads of materials should result in more tonnage handled over the road and faster movement of materials at both shipping and receiving points.

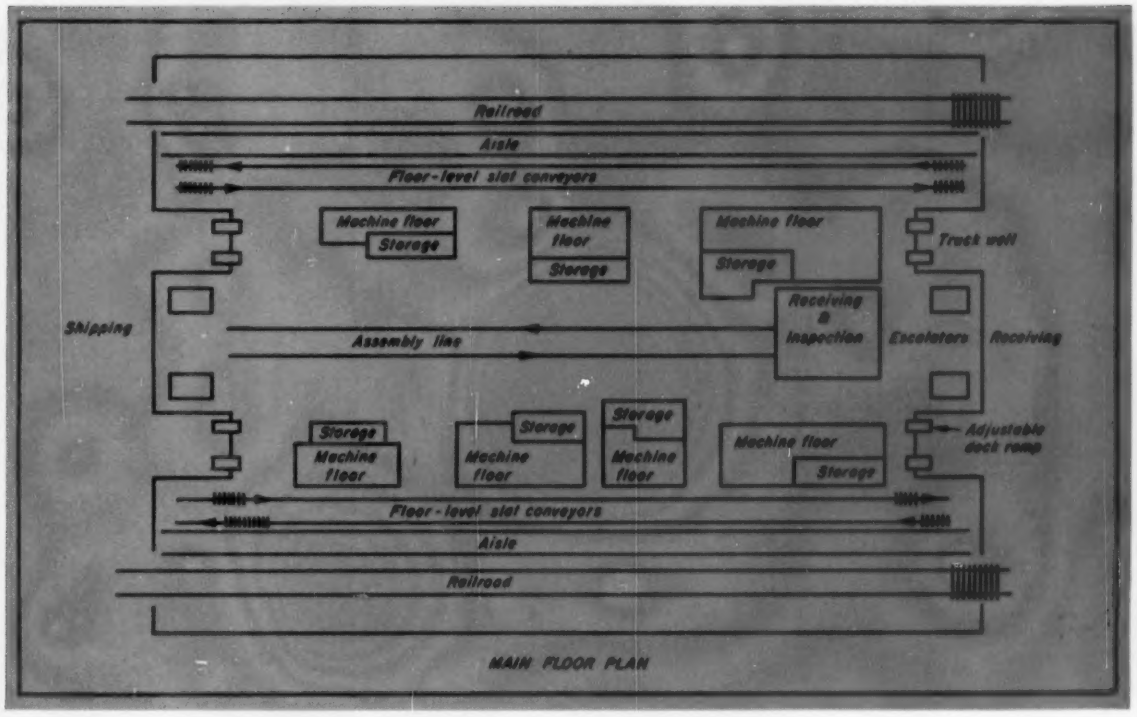
Currently, the ton-mile cost of moving materials by industrial trucks within plants comprises, in the writer's opinion, an average of approximately 30 percent capital investment and operating costs plus 70 percent driver labor. Both of these costs may be reduced by the utilization of maximum possible loads and reduction of truck travel distances.

Collapsible containers will result in the movement of more empty containers per truck trip and free trucks for pay loads in return directions. They will also require smaller stowage space when empty and collapsed and drastically reduce transportation costs via common carriers.

These containers should be engineered for common use, as much as possible, in both dimensions and features. Discharge doors or tip-over design to place materials at the machine or assembly operator's hand will increase productivity and reduce manual effort.

To obtain maximum efficiency of trucks and reduce

R. W. BUTLER, consulting engineer of Flint, Mich., recently retired from the Chevrolet Mfg. Div., where he was material handling engineer.



aisle space required would be basic considerations in a plant designed and laid out somewhat to the following sketch features.

All materials received via highway carriers would be received at one end of the plant. Railroad tracks will run completely through the plant on each side and adjacent to the longitudel walls—with switching movement possible from each end. Tracks will accommodate sufficient cars for movement of heavy materials not practical to transport via road trucks.

Trucks To Cross Conveyors

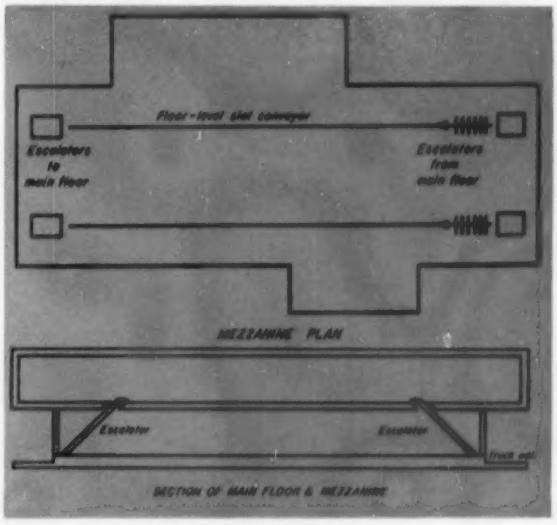
On the plant side of the tracks there should be an aisle not less than 10 feet wide, running the full length of the building. Next to this aisle would be two floor level slant conveyors, running in opposite directions. They will have capacity to carry the plant's maximum loads and permit crossing with loaded industrial trucks. Speed of these conveyors will be as low as possible, consistent with the volume to be moved.

There will be sufficient slots entirely within the building to accommodate maximum length carrier truck units with the plant doors closed. Ramps, if necessary, will have not more than 5 percent grade and approaches of sufficient area to permit the maneuvering of truck units into place. Each truck slot shall be equipped with a mechanical dock leveler of sufficient length to give minimum slope.

There could be two truck slot units with sufficient space between them for sufficient elevators or escalators to move certain materials to a higher space.

The rail car loads of materials should be placed adjacent to the warehouse space and/or primary machining operation of that part. If materials are in containers or in unit loads they can be moved across the

PRODUCTIVITY of all equipment is high in plant where continuous movement is provided by floor-level conveyor which can be crossed by loaded trucks. Views below show conveyors between shipping dock and mezzanine, where long travels are via floor conveyor.



aisle and slat conveyors via industrial truck—and decked in stowage or placed at point of use. If materials are not in containers they may be transported overhead to warehouse or use space, but this will always involve some manual labor in loading or unloading the mechanical carrier. Therefore, the fully efficient plant will see to it that, as far as possible, unit

(Continued on page 222)

1955
1956
1957
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1959
1960
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1964

1965 ONLY A THRESHOLD...

By William H. Meserole, President of Ballinger-Meserole Co., Philadelphia, specialists in warehouse systems.

WORKADAY engineers, trapped in a world of hum-drum custom and practicality, seldom have a chance today to indulge in creative fancy. They have too little time to hover over the threshold between the present and the future.

But that is where Da Vinci conceived machines before the metals were ready to build them . . . where Roebling, in his mind's eye, spun his spiderweb of steel across a mile of water before cable was conceived . . . where Langley planned planes which were not to be airborne until internal combustion engines were designed to weights of a pound per horsepower.

Such dreams were usually just a few generations before the facts, just a step from the threshold to reality.

Modern engineers have the background, education, experience and imagination to propose for the future designs which may not be economically feasible today. And, given an opportunity, like this one, can take a look over the threshold.

"Wishing" Ruled Out

It takes no elastic imagination to assume that our grandchildren or great grandchildren will see the facts of production and distribution so altered that today's plants and costly processes will be very old hat indeed.

Let's take a trip into our own mind's eye and see what they may see.

The small print on the back of our ticket tells us the conditions under which we may travel. "Fancy must remain within the scope of the prospectively practical." Ruled out is misbehavior like telekinetics and other ways of wishing things done. The dry and dull functions of tending lathes, receiving-storing-selecting-shipping goods are not done by wishing. Ruled out, also, is pre-awareness of the nature and array of customers' orders, for their wants are vagrant and varied.

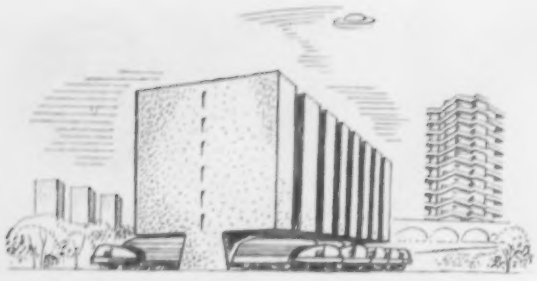
Ruled out of the food department are concentrated ration pills to be dispensed from automatic machines; such fodder will be unwelcome to a people who live to eat as well as eat to live. Also out are minor refinements of existing means, methods and machines. These interim devices set such obvious limits to progress—practical though they seem in today's limited vision.

Ruled out is pure automation. It can deal only with repetition, which hardly applies to distribution since the infinite assortments and different quantities people want vary kaleidescopically with each transaction and between all transactions.

Terms of sale of our tickets permit travel only on "conveyances" now remotely possible—as we envision possibility.

(More on next page)

◀DISTRIBUTION MACHINE receives, stocks, picks and issues orders, keeps records—all automatically.



If we soar to buildings, these must be structures, as now, though of course modified in design, type and material for dimly foreseeable tasks. Or, if it be the chariot of techniques we would ride into the future, these may be only techniques easily forecast from today's levels of mechanics and electronics.

We shall leave a world on the threshold of unheralded achievements. This is the best possible point of departure. With the age of carbon fuels in full flower—with science, mechanics, and invention reaching out for the atomic age a hundred years hence—we leave at a mid-point where the trends are sadly mixed.

World's Work Clamors for Hands

For example, giant strides have been taken in somatics with greater steps in the offing. The life expectancy of a child born today is over 70 years—three to four times what it was when the industrial revolution exploded in the face of an unready world.

Unready were we for the biological surprise that followed the last war. While savants were shouting that we must ready ourselves for a leveling-off of the population curve and a static high-average-age, our sons were too busy with the war to listen. They returned to produce families averaging larger than the country had seen since the middle 1800's. Many times as many families, too. Their children are flooding now into cramped schools and housing, and production for their needs and comforts has sagged way behind demand.

This despite more and more machines, said to be displacing manpower, while more manpower than ever is at work. Still there is not manpower enough for the world's work, clamoring for hands.

Generation after generation—for hundreds of years to come—similar population explosions will be felt; population and consumption will soar like a multi-stage rocket. We must gear for this or famine and pestilence will rise as the balancing force.

How we will meet it will grow out of scientific achievement, increased knowledge, improvements in technologies—as we exhaust the world's raw materials and have to create yet-unheard-of materials from inexhaustible sources like the sea and the common earths themselves. Catalyzing the new techniques, man's machines will replace man for all routine production, coordination, timing, finding the logical answers to pure problems however complex, giving unblinking attention to routine areas where machines leave man the dust.

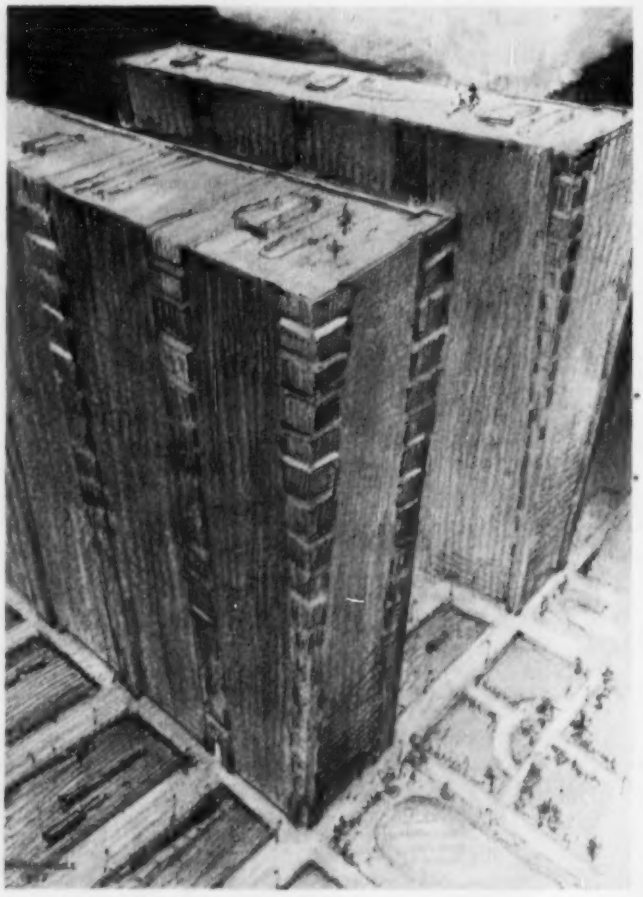
With a population twice or thrice 1955's, our labor force will be too small to fill the jobs that machines cannot do. Certainly we shall not waste man's critical capacities on simple judgments that can be handled better by feed-back mechanisms.

At the point where machines are frustrated, men will revel in the problems, ultimately build new machines to take on the work. Thus an ecology will evolve, to parallel nature's, in which each thing contributes to a state permitting existence in a constant balance.

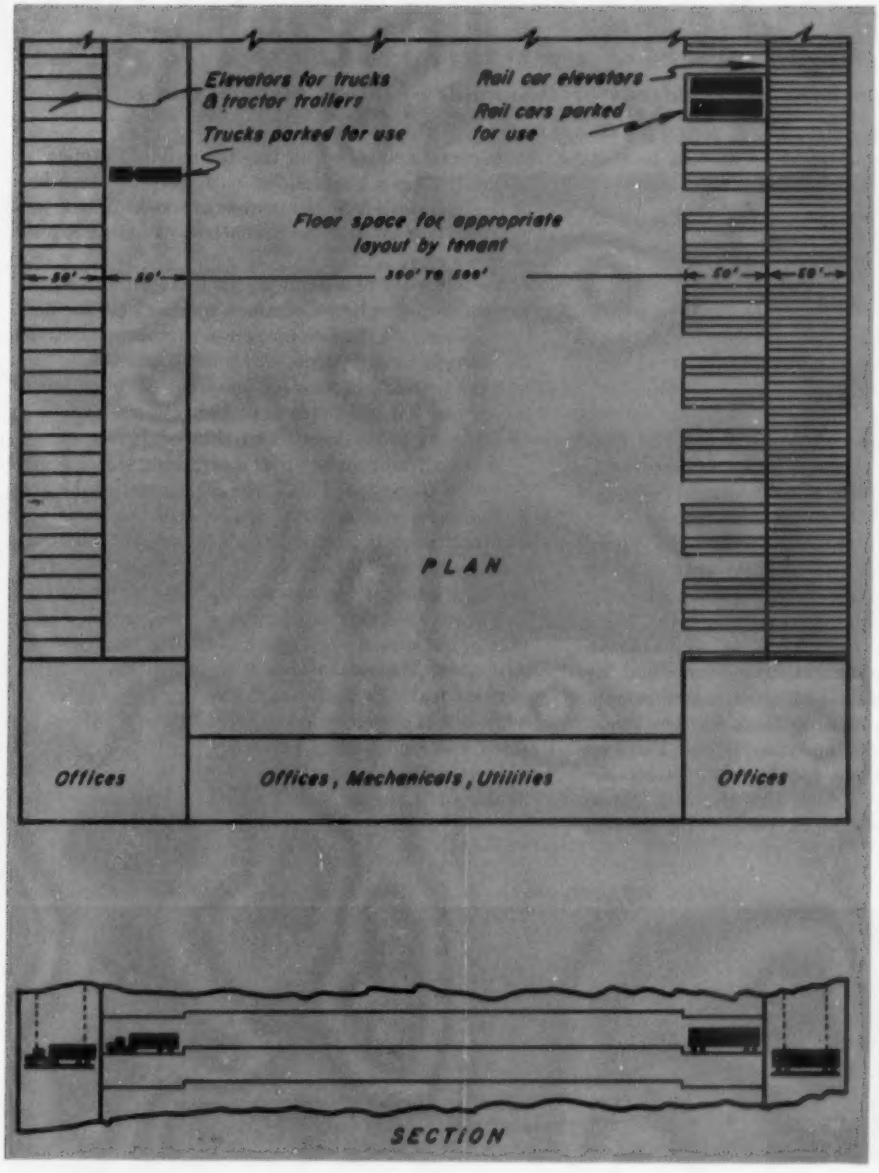
These are the implications, possibilities—even hopes—as we prepare for our journey into the future.

Time—Ship Travel

So, as rules-observing passengers, let's board our saucer and zip into a tomorrow a hundred years away.



HUNDRED MILES from Suburbia, where land is too expensive to allow sprawling plants.



ONE STORY buildings still exist, but they are piled on top of each other, served by lifts for common carriers.

BELOW GROUND, as deep as 10 levels, are the railroads, and, on other subterranean roads, cars & trucks.

Amid the whistle and thunder of rockets we swoop up over today's tawdry city of smoke, blight, industrial squalor, and sprawling smoking plants thinning into suburbia. We are impressed that man is a dirty animal, but no more impressed than government, tax-collecting agencies, civic-minded groups, and the erstwhile residents of these areas who have been moving out.

Over on that hillside sloping down toward what was once a clean river, we see the ugly scars of refuse dumps—here because the land isn't suited for the structures of manufacturing and distributive plants. The river is olive drab and sluggish. (But some can remember flying kites from these slopes.)

We catch all this in a glimpse, then acceleration blurs the scene. And in a moment we are ahead in time and back in space at the point of departure a hundred years ago.

Where we saw smudge and smaze and factory blight we see the cool green of growing things. Much of the area is green. Great, simple buildings are widely spaced out in rows as far as the eye can see. How far apart they are! But though they are so numerous and so huge, only about 20 percent of the area is built over. The rest is park, even forest!

Now our pilot tells us to loosen straps and step to

(More on next page)

the ports. We stare in amazement as he tells us that these vast buildings are distribution depots, manufacturing plants and residences all in one, that they house all of man's activities—his offices, factories, warehouses, homes, schools, stores, parks.

Parks?

Surely, those are parks on the roofs. And the people who work in the building live in them, with their families and their hydroponic gardens. Everything they need is aloft.

One mile-square group of these buildings covers more than 25 million square feet per floor. The hundred-floor levels here include over 2.5 billion feet—this is but one of thousands of such clusters!

But what is so radical about all this? Except scale. The roots were visible in any 1955 metropolis. There were garden apartments with trees growing on the balconies. There was Rockefeller Center and the Empire State Building.

Musing back on the begininngs of subterranean transportation and communications—exemplified by Twentieth Century subways—we hear now that railroads come in below ground on four, six, ten levels. And cars and trucks, too, on other levels. The vast sides of these buildings are faced with gigantic elevators making yesterday's look like pygmies. Some sides carry rail cars, others trucks. Vehicles are elevated to any level and rolled off into the building proper.

It only takes a hundred feet to do this, of which half is the elevator, half the apron or dock. What is a hundred feet around the perimeters of a square mile of structures?

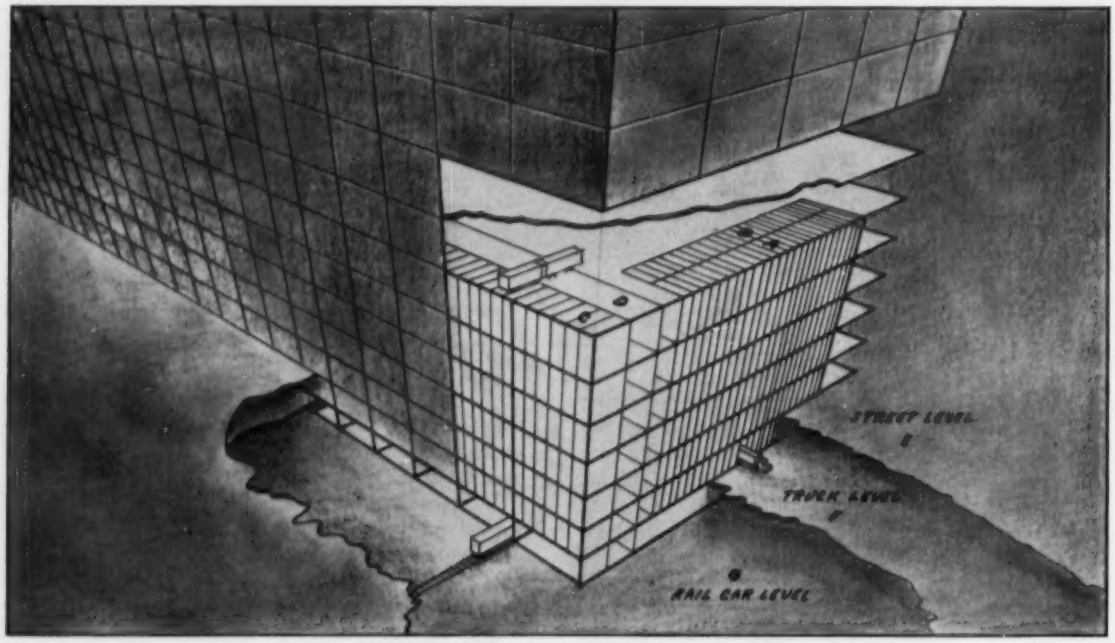
There's a lot of machinery in these buildings, too, we learn—not only the common mechanicals for heat, light, power, air conditioning, water, sewerage but also for manufacturing purposes, planning and accounting. It is the production base for hundreds of thousands of things planned and made here and millions of tons of commercial goods sorted and shipped here.

As noted, land surface is at a premium, since population is so enormous. That's why 80 percent of the area is restricted, and nothing can be built on it. It is a hundred miles in any direction to suburbia, and not even a hundred miles out is land cheap enough to permit wasting it for sprawling plants, yards, sidings.

We are told that the city is no longer an asphalt jungle, but a balanced organization of grass, trees, and structures. The closed system in which mankind and animals make carbon dioxide for plants to consume, while plants produce oxygen for animals, now is understood and kept well in balance.

Even so, man's structures have to be great to house double or triple the population that dwelt and worked

(Continued on page 236)



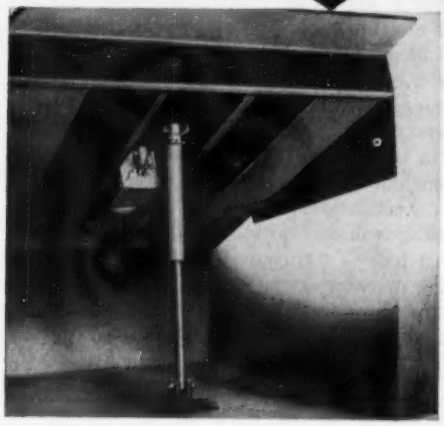
SELF-CONTAINED industrial center: (A) battery of truck elevators; (B) docks for trucks on each floor; (C) battery of rail car elevators; (D) dock for rail cars on each floor; (E) ground level where luxuriant greens grow; (F) below ground, where trucks are free of traffic snarls; and (G) even further down, where rails enter.

NEW! Versatile...Easily Installed!

GLOBE TRANS-O-MATIC RAMPS

To speed loading and cut handling costs, Globe's new Trans-O-Matic Ramps bring dock level to truck bed level with fast push-button control. Platform measures 6' x 8' 4" including 14" all steel lip.

Sturdy hydraulic jack is operated by power "package" consisting of motor, pump, reservoir and valves. Entire mechanism is weather-protected and snugly mounted between supporting box members for extra protection.



MULTIPLE SAVINGS—INCREASED DOCK CAPACITY

Truck loading and unloading is smooth and safe... costly rehandling of goods is eliminated... when Globe Trans-O-Matic Ramps go into action on your loading dock.

Because goods move swiftly across platform without interruptions, your present dock area can handle two or three times *more* freight. Material handling costs are substantially reduced.

25% GREATER RANGE

Lip of steel ramp moves 15" up or down from horizontal to provide full 30" travel. Ramp "floats" with rising or lowering action of truck or trailer floor. Unique lip design provides smooth roll-over.

NO EXCAVATION OR PIPING

Entire Trans-O-Matic mechanism is *above ground*, permitting quick, low-cost installation. If need be, complete ramp can be easily moved and relocated without loss.

BOX CONSTRUCTION PROVIDES EXTRA RIGIDITY

Two parallel box members, of ¼" steel plate, reinforce ramp and provide added strength without weight. Ramp sustains roll-over weight of 20,000 lbs., and storage loads up to 400 lbs. per sq. ft.

CHECK THESE AUTOMATIC AND SAFETY FEATURES...

- ✓ Ramp "floats" automatically with changes in truck bed height.
- ✓ Automatic safety lock holds ramp in fixed position when truck pulls away from dock.
- ✓ At platform level, ramp locks in place to accommodate cross-traffic and storage.
- ✓ Skirts at sides provide full protection as toe guards.
- ✓ Non-slip checkered steel plate assures firm footing.

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TRANS-O-MATIC RAMPS

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Handling Exposition

TO DEMONSTRATE with finality the devaluation of muscle and sinew as material handling tools, some 250 exhibitors will employ approximately $10,000,000 worth of equipment at the 6th National Materials Handling Exposition to be held in Chicago's International Amphitheatre May 16 through 20.

The Exposition Management—Clapp & Poliak, Inc.—is predicting an attendance of 25,000 or more visitors. Most of these will come from North America, but all parts of the world, with the exception of the posterior sides of the Iron and Bamboo Curtains, are to be represented.

In keeping with the serious and objective purposes of the Exposition, the American Material Handling Society will conduct the 6th National Materials Handling Conference May 16 through 18. The Conference sessions, like the Exposition, will take place in the International Amphitheater. The Conference Chairman is Lynn J. Riege, Engineer, Materials Handling Equipment, United States Gypsum Company, Chicago.

Adoption of the Theme

The Exposition-Conference theme, "The Concept of Obsolescence", was adopted with the thought of impressing upon industry, through demonstration, lectures and discussions, the need for progressive modernization of handling systems and handling tools. To a far greater extent than ever before, the Exposition is expected to offer demonstrations of systems as opposed to demonstrations of machinery alone.

With the "Second Industrial Revolution" bringing into operation power forces as yet hardly beyond the esoteric stage, adaptation of electronics, television and radio to manufacturing and handling processes—and with labor dedicated to achievement of the guaranteed wage and shortened work-week—Industry's eyes are focused more intently than ever before on efficient and economic production. For this reason, the 6th National Materials Handling Exposition is expected to set a new high in visitor interest and attention.

The Show's theme might just as well have been identical with the theme of this issue of FLOW—*Material Handling and the National Economy*, 1955-1965—because in most of its aspects it will point up things to come. It will demonstrate—in exhibits and conferences—the obseleting effects of the new forces, new engineering concepts, new labor philosophies and "pressurized" competition on methods and equipment as new, perhaps, as today.

Because the demands of the next decade are certain to be more exacting, more virile and more pressing than ever before, and because of the almost-daily discovery that, in spite of the advances of the past ten years, material handling operations still present the greatest opportunities for cost reductions, this Exposition is expected to attract unprecedented top-management interest and attention. On the operating level, Material Handling Engineers and engineers in many other categories, plant superintendents and managers, production managers, traffic and warehouse managers—"the men who plan, engineer and direct the handling of materials in the nation's industrial plants", to use the Exposition Management's language, are expected to attend this event in great numbers.

The Exposition will demonstrate, as does this issue of FLOW, that today's concepts of material handling and impending practices are a far cry from those of 1947 when this Show was inaugurated in Cleveland. Today, material handling enjoys a major role in the operation of an efficient plant; it is as important as process engineering and product development. It has progressed in concept from picking up, carrying, and stacking to continuous movement through production and assembly equipment and stages.

The maintenance of production flow now is regarded, as it should have been from the start, as material handling. New tools for implementation of this accelerated and cost-reducing production flow already are at work. Some of them will be seen at the Chicago Show. Others destined to obsolete current methods and equipment still are in the drawing-board or idea stages. All are clamoring for creation and acceptance. Eager representatives of industry are expected to learn much about them at this Exposition and Conference; to hear how they can be and why they must be applied to industrial operations of the future.

Highlights of the Conference

Major points to be brought out in the Conference sessions sum up about like this:

1. Production flow demands faster, more efficient, integrated material handling equipment to feed machines, remove finished products, remove scrap and keep "in-work" moving from machine to machine.
2. Inventory can be reduced (freeing capital) by faster and more efficient material handling.
3. Present inadequate storage space can be put to better use by equipment that stacks higher, re-

(Continued on page 234)

to Study Obsolescence

MATERIALS HANDLING CONFERENCE

May 16 through 18

Monday, May 16 (10:00 A.M.-12:00)

Materials Handling in Today's and Tomorrow's Economy"
Douglas A. Gillespie, National President, American Materials Handling Society, Northern Electric Co., Ltd., Montreal.

"*Role of the Materials Handling Engineer in Cost Reduction.*"
Lynn J. Riege, (Conference Chairman) Engineer Materials Handling Equipment, United States Gypsum Co.

Key Note Address:
Fred M. Gillies, President, Acme Steel Company

"*Effect of Obsolescent Materials Handling Equipment on Today's Production Costs.*"
Fred V. Gardner, Management Consultant, Milwaukee

"*Recent Advances in Materials Handling Equipment and Techniques and Their Effect on Today's Production Problems.*"
R. C. Waehner, General Manager, Distribution Division, Lever Brothers Co.

PANEL A

Tuesday, May 17 (9:00 A.M.-12:00)

Receiving, Warehousing and Shipping: Discussions involving purchased materials, including storage patterns, palletization, containers, loading and unloading facilities.

Moderator—Irving Footlik, Material Handling Consultant, Chicago

Speakers—"*Storing by Popularity*"
William Mackey, Superintendent Warehousing, Calumet Industrial District Company, Chicago

"*Storage Space Layout*"
Andrew J. Briggs, Bureau of Supplies & Accounts, U. S. Navy

"*Better Allocation of Space to Reduce Inventories*"
Bert Woldring, Manager of Product Development, Rapids Standard Co., Inc., Grand Rapids

Panel Members—Walter Brager, Production Control Manager, Oscar Mayer Company
Harry C. Madsen, Coordinator, Company Shipping & Warehousing, Corn Products Refining Company
Raymond B. Mansfield, Material Handling Engineer Zenith Radio & Television Corporation

1:30 P.M. to 3:00 P.M.

Panel discussions to ensure that the many questions from the participants receive detailed attention and explanation

PANEL B

Tuesday, May 17 (9:00 A.M. to 10:30 A.M.)

Equipment Ownership vs. Leasing: Replacement and Maintenance
Discussion of problems relating to purchases, either as new equipment or as replacements. Purchase plans. Preventative maintenance.

Moderator—Howard Bernstein, Pres., Atlas Lift Truck Rentals, Inc., Chicago

Speakers—"*Advantage of Liquefied Petroleum Gas for Industrial Trucks*"
Cleve T. Hendrix, President, Industrial Gas-Truck Engineering Company, Chicago

"*Advantages of Rental or Leasing Agreements*"
Frank J. Babcock, President, Universal Material Handling Corporation, Flint, Mich.

"*Automation Replacement*"
Henry F. Fernstrom, Barrett-Cravens Company.

Panel Members—Henry J. Limbright, Supervisor Industrial Truck Section Material Handling Engineering Department, Ford Motor Company
Miles J. Rowan, Managing Editor, Modern Materials Handling
Therman O. Darnell, Materials Handling Supervisor, The Dow Chemical Company

PANEL C

Tuesday, May 17 (10:30 A.M. to 12:00)

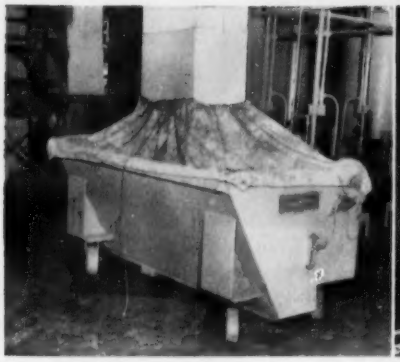
Analyzing the Materials Handling Problem: Its relationship to plant layout, production and production controls.
Moderator—Byron W. Saunders, Associate Professor, College of Engineering, Cornell University

(Continued on page 198)

Here's *MASS-HANDLING* of bulk

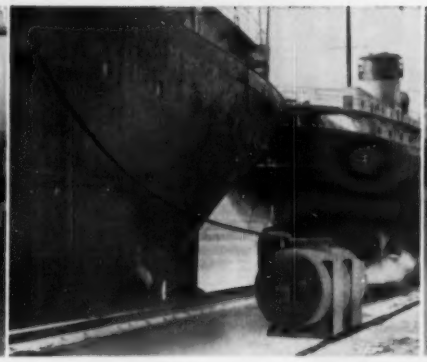
What you see above is a Dempster-Dumpster serving one of its detachable containers. Multiply this simple pick up, haul and dump operation by scores of steel containers built to meet your requirements for handling waste or salvable materials, raw and finished products, fluids including acids, combustibles, dusty materials, etc. You have, then, mass-handling of bulk materials with one truck and one man!

DEMPSTER BROTHERS



Tilt Type Container is handling filter dirt at a plant in Illinois. Note container is equipped with casters and placed under chute, through which the filter dirt passes directly from presses. As each container is filled, it is replaced with an empty one.

Three heavy duty Drop Bottom Type Containers, shown below, are loaded with cast iron fittings from conveyor at plant in Birmingham. Dempster-Dumpster picks up each container when loaded and hauls the finished products to shipping department.

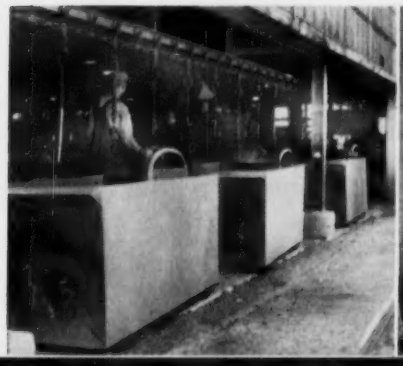


Tank Type Container is being filled with used oil from a ship. Time required to haul loaded container to reclaim station, drain and return for refilling—10 minutes. Time cycle of the former method using conventional barrels—60 minutes.

Here's another example of the many types of waste materials handled by this system. The Skip Type Container shown below is located under hydropulper at a paper plant. Picture was shot while container was being filled with rope waste sludge.

A loaded Apartment Type Container, equipped with roller bearing casters, is being rolled to outside of this plant building. Dempster-Dumpster will pick it up, haul to disposal area, dump the refuse and return empty container for refilling.

Waste materials are loaded into these Universal Containers at a food plant warehouse. Containers have lids in top, as well as a door in each end, which are opened to make deposits, then closed, sealing materials in container.



materials with one truck...one man!

A FEW OF THE HUNDREDS of containers available are shown above in actual service. They are built in capacities up to 21 cu. yds.—several times the capacity of the average dump truck body. One Dempster-Dumpster, operated by only one man, the driver, serves scores of big detachable containers, one after another—handling materials of every description. It's like having one truck with scores of bodies!

Records of performance in dozens of installations prove beyond question that savings are tremendous! The Dempster-Dumpster System cuts costs of equipment and operation. It is common knowledge that one Dempster-Dumpster will perform the work of several conventional trucks, reducing investment accordingly. This system eliminates standing idle time and re-handling of materials. Once placed in these containers, materials remain there until hauled to destination. Efficiency, sanitation and good plantkeeping are big advantages. Materials to be transferred or disposed of are constantly being placed in the containers as they accumulate. Containers for handling refuse are fire-proof, rat-proof and scavenger proof.

With no obligation on your part, our engineers will be glad to make a comprehensive fact-finding survey to determine the cost-cutting possibilities of this equipment in your plant. Write us for complete information today! Manufactured exclusively by Dempster Brothers, Inc.

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HANDING . . .

(*Continued from page 98*)

ahead of him with better, faster service than he can build into his own operation.

Tradition and know-how are handicaps. Even with a good standard product, with which a firm may have been identified for years, it can easily lose the market to a company without the restrictions of experience and existing equipment. The new firm can automate the production of a redesigned product and bury the old plant in its dusty tradition.

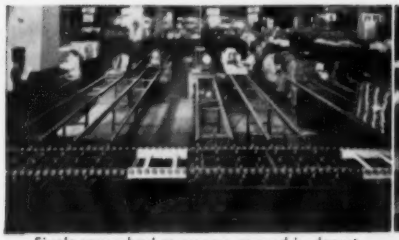
Competition is increasing from foreign areas where labor is plentiful and cheap. See what has already happened to the bicycle industry! It has lost half its market to foreign competition. Cars and cameras, among other commodities, are facing stiffer competition from overseas producers. There's no need for us to lose such markets. Goods of all kinds can be made—and will be made—cheaper, better and in larger quantities with mechanized American operations.

Production Machines Need Not Be Redesigned

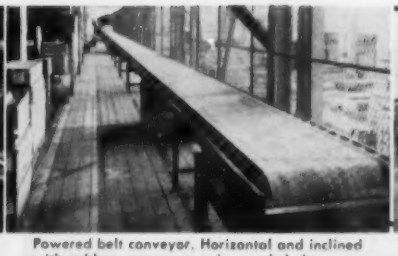
"Automation" means widely different things to too many different people. It is simply the mechanization of handling in all phases of production and distribution. Included is the vitally important mechanical handling of parts during machine operations.

It is true that modifications of metal working equipment will frequently include automation devices which will work integrally with machines. But, just as often, automating will not effect the basic functioning of a machine, or group of machines. It will provide the essential elements for automatic indexing, transfer, and quality control.

There is no current indication that tools and machines we now have cannot do many of the jobs of the future if they are properly integrated into mechanized systems. They have the capacities to maintain high quality at higher speeds, and with greater safety, if they are equipped with automatic



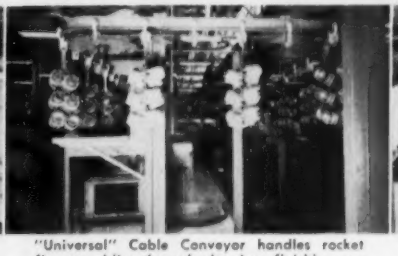
Single-row wheel conveyors as used in department store marking rooms.



Powered belt conveyor. Horizontal and inclined with rubber, canvas or wire mesh belts.

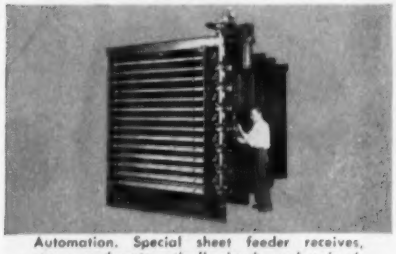
Apron conveyor assembly lines, ball-transfer switching station, in major appliance plant.

Overhead cable and roller conveyors, as used in wholesale drug warehouse for order picking.

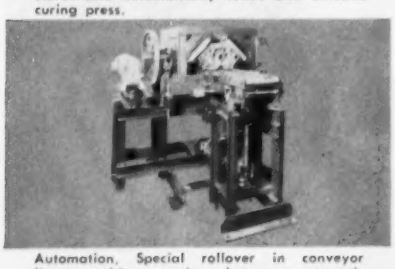


"Universal" Cable Conveyor handles rocket fin assemblies through cleaning, finishing operations.

Gravity roller spurs deliver cartons to live roller "accumulating" conveyor to sealing, shipping.



Automation. Special sheet feeder receives, stores and automatically loads and unloads curing press.



Automation. Special rollover in conveyor line repositions castings between automatic operations.

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A Buschman engineer is ready to help you select the best type or combination for your particular operation. (No obligation, of course.)

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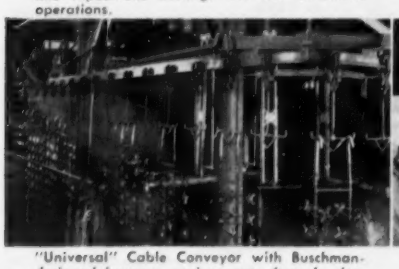
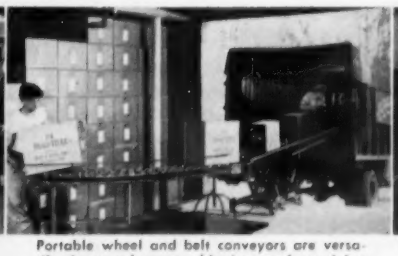
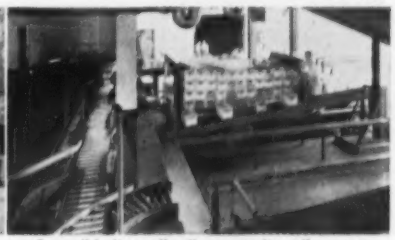


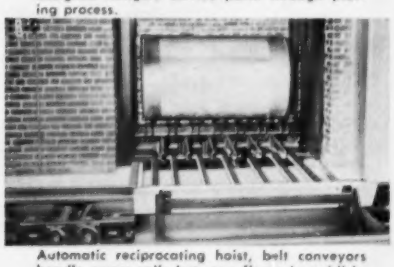
"Universal" Cable Conveyor with Buschman-designed hangers carries parts through plating process.



Portable wheel and belt conveyors are versatile in warehouses, shipping and receiving docks, stock rooms, etc.



Reversible live roller lines, gravity roller spurs simplify operations of bottling plant.



Automatic reciprocating hoist, belt conveyors handle paper rolls between floors in publishing plant.

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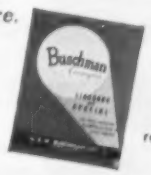

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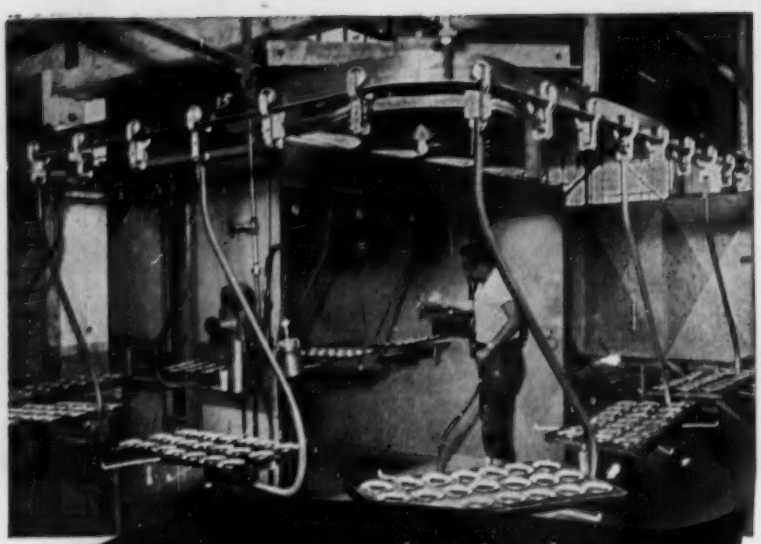

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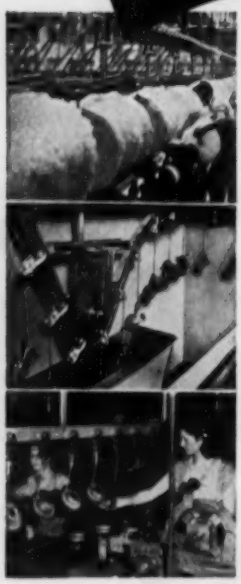

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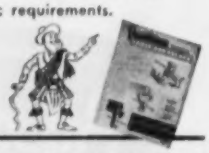

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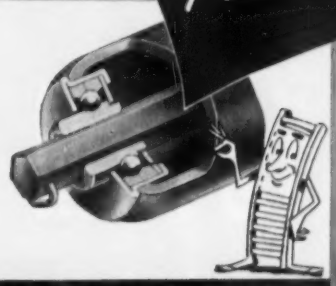

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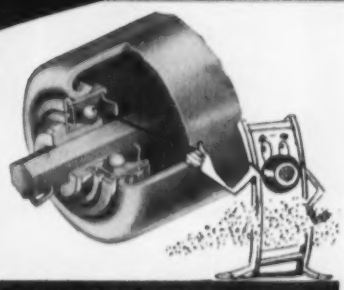

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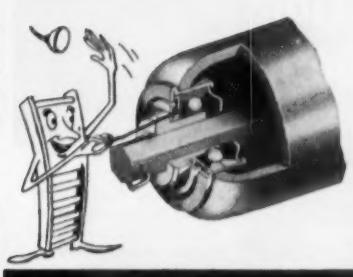

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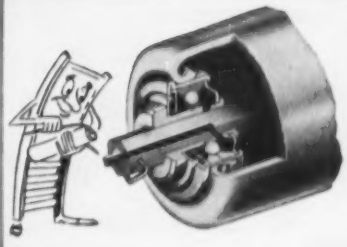

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In roller conveyors, it's the bearing that counts! And BUSCHMAN conveyors use only performance-proven bearings... engineered for long life and trouble-free operation in every type of service. No matter what normal operating conditions may be, BUSCHMAN has a conveyor pre-engineered to meet your needs.

Conveyors are available with various types of rollers and frames, in different sizes and spacings, and in any width from 6 inches on up. BUSCHMAN can supply 45° and 90° curved sections, switches, spurs, work stations and other components to provide a complete, efficient materials handling system.

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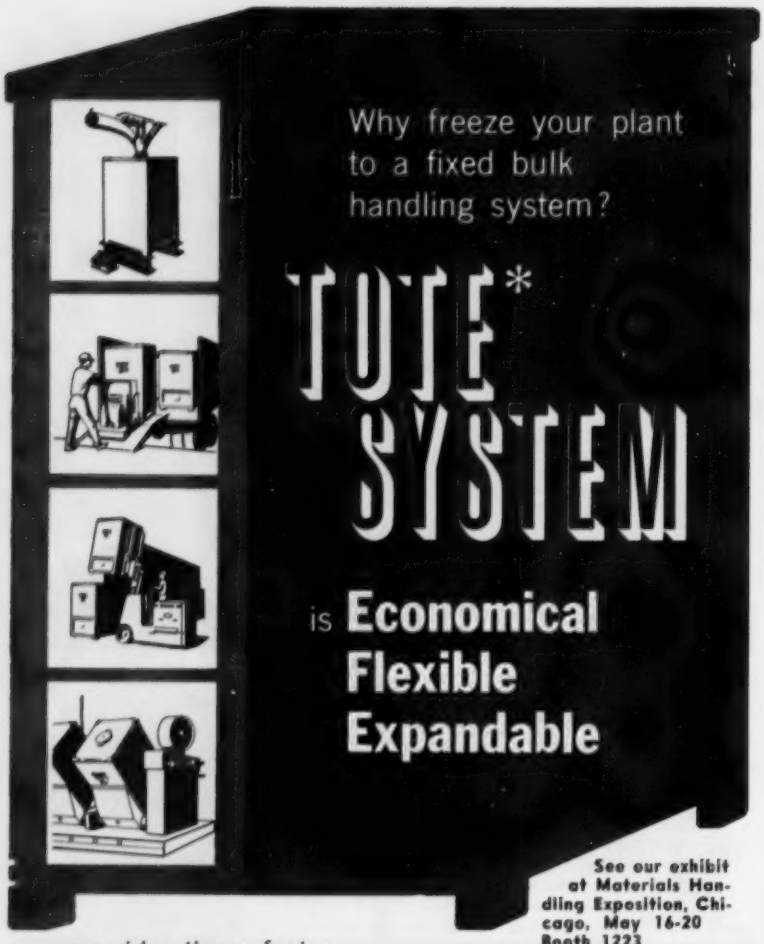
Why freeze your plant to a fixed bulk handling system?
TOTE* SYSTEM
is Economical Flexible Expandable
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consider these facts:

1. Tote System is a *complete* bulk material handling system built around easily handled and transported aluminum bins plus automatic filling and discharging equipment.
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   - For inter-plant shipment of bulk materials.
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Tote Engineers will survey your plant to determine the savings you can effect—at no cost or obligation.

Meanwhile, write for illustrated literature.

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loaders and unloaders, and if they are physically pulled together into logical arrangements.

There is an advantage in starting an automation program on this basis. A minimum of investment in new equipment is required, and equity in existing equipment can be salvaged. As demands for greater production grow, further investments in equipment can be made on sound capital investment policy.

As for the expense of automating, consider the situation where a firm might want to double the output of a part. If the addition of loaders and unloaders to a machine will accomplish this at a cost of, perhaps, $15,000—and a second machine will cost, say $50,000 —there will be an immediate saving of $35,000. And this does not consider the economy in manpower effected through the release of at least one operator. Then there will be savings in overhead. Automation invariably increases output per unit of plant area.

Buy For the Future

If new machines are going to be needed in the near future, they should be purchased with the anticipation of automation. They should be fully operable by remote control and suitable for automatic loading and unloading. Capacities should be well in access of any anticipated demand.

Of course, the most desirable arrangement is the initial procurement of automated systems or machines.

Automation cannot be bought from a catalog. It must be designed to each plant's requirements. Probably, too, the production machine anticipated for future use will not be listed as a standard item.

A firm will be money ahead to order for far future delivery the machinery it knows it will ultimately need. It is not too soon, today, to order equipment that will be put into use five or even ten years hence.

Automatic operation will not be

If you're growlin' about replacement costs . . .

IT'S TIME TO SPECIFY **MONARCH** INDUSTRIAL SOLID TIRES

IF YOUR COMPANY HAS MONEY "TO BURN" . . . TURN THE PAGE. We are talking *only* to buyers who want to reduce solid tire replacement costs . . . with no sacrifice of performance or quality. That's our specialty. That's why Monarch gives you premium lift truck tires at standard prices.

Monarch pressed-on solids are manufactured from higher quality materials than *the best premium passenger car tires.* This is no idle claim! Our tires last longer because they actually are made better. It's as simple as that.

We can supply a complete range of types and sizes to meet every normal or special need.

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Engineered fatigue tests . . . on these standard tires . . . produced these results *For the complete story, write for Bulletin TD-200.*

. . . MONARCH Mono-Cushions® WEAR BETTER . . . LAST LONGER

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Richards-Wilcox NEW "460"

Continuous Power Chain Conveyor

With a capacity of 8½ lbs. on six-inch centers or 17 lbs. per lineal foot and a 200 lb. draw bar pull, R-W "460" offers safer, more efficient handling of light loads. Exceptionally flexible and versatile . . . lighter load limits . . . and minimal engineering and structural requirements make it extremely economical. It is recommended as a supplementary conveyor unit in production lines and to facilitate movement and handling where the use of drying ovens, washers, paint sprayers, de-greasers and similar operations are involved. Available up to 200 ft. maximum lengths *only*.

Completely packaged and shipped from stock.

R-W "460" Conveyors are completely packaged in easily handled units. Orders to fill any requirement up to the 200-foot maximum are readily filled from stock. For complete information write for descriptive catalog number A-96.

Richards-Wilcox Mfg. Co.

MATERIALS HANDLING DIVISION

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SLIDING DOOR HANGERS & TRACK • FIRE DOORS & FIXTURES • GARAGE DOORS & EQUIPMENT • INDUSTRIAL CONVEYORS & CRANES • SCHOOL WARDROBES & PARTITIONS

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fully effective unless product or part designs are considered in basic planning. And frequently slight redesigning will produce not only easier and faster handling but also better products. There is ample precedent for this in recently automated operations.

"Job Shops" Can Profitably Automate

It makes no difference whether a shop turns out 10 or 10,000 items per time unit. Automation will do the job better and at less expense. Any time the same number of employees can turn out increased production with the same, or less, effort, a plant is going to improve its financial position and gain competitively. Automation will make it possible for a shop or plant to produce to meet demands of the season or moment.

It will not be necessary to have a standardized, single product—a fallacy which has been widely accepted. An automated system can be made to produce a wide variety of items. Provisions can be made for fast changeovers as they are needed.

The benefits from this factor, alone, will be tremendous. Inventories will be kept in raw materials —not in finished parts, which carry a high inventory cost—and production can be easily scheduled to meet immediate assembly requirements.

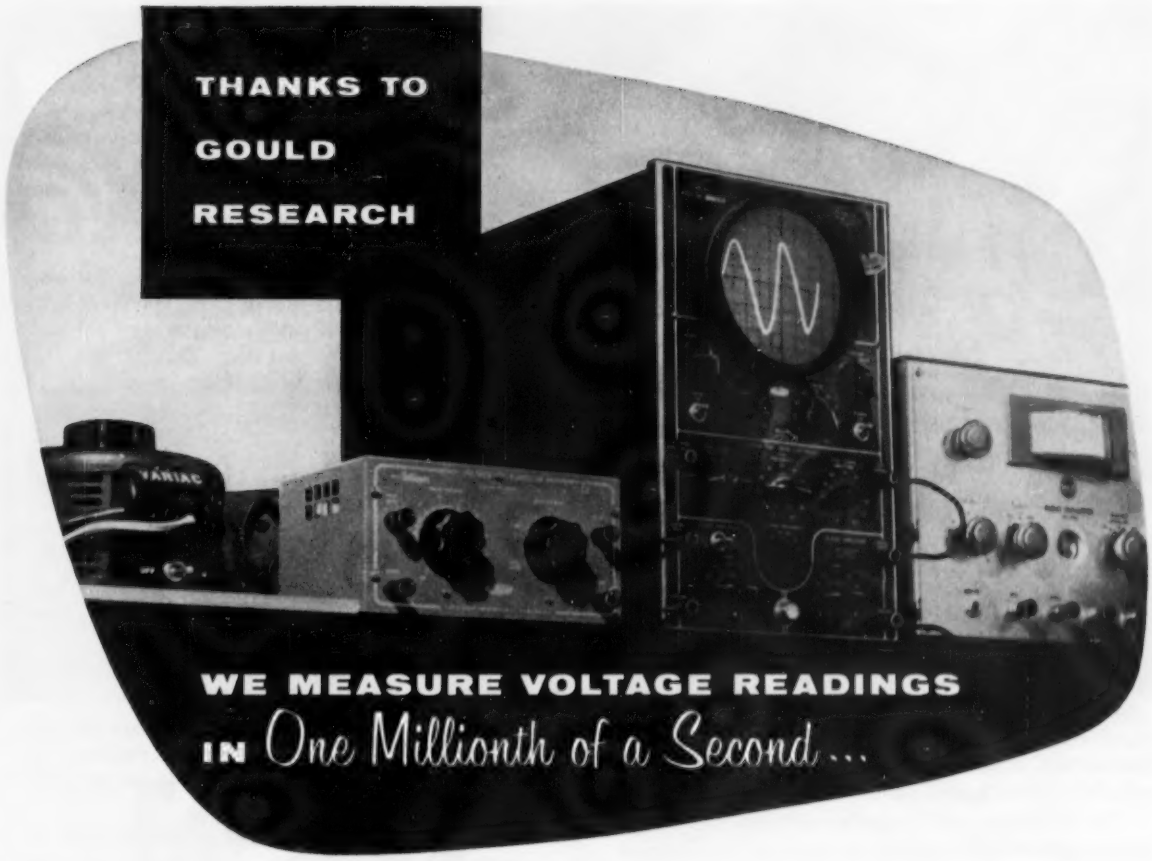
Requirements for Engineers

Personnel who design or lay out mechanized handling operations will have to be versatile, imaginative fellows. They must:

a. Know the fundamentals about all types of manufacturing and handling equipment.

b. Recognize the ultimate production potentials in all types of equipment, as well as limitations imposed by manual operations, tooling, etc.

c. Have a comprehensive knowledge of mechanical, electrical, hydraulic and



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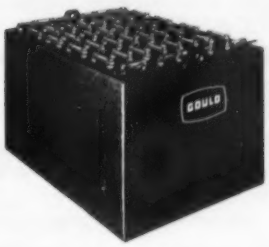

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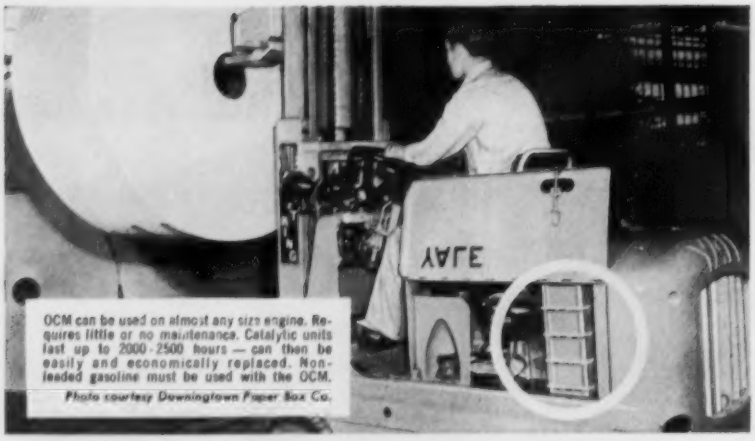

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Now you can operate lift trucks, bulk handling trucks, stationary engines — any type of gasoline- or LP gas-powered equipment — efficiently, safely, in even closely confined areas. For the OCM Catalytic Exhaust eliminates 95% or more of the deadly carbon monoxide, and 90% of the hydrocarbons, from the exhaust gases.

The OCM Catalytic Exhaust is made to replace standard engine mufflers. It's now available as optional factory-installed equipment from leading manufacturers, such as Buda, Clark, Yale & Towne, and Lincoln-Schlueter. Or it can be easily installed on present equipment by your own mechanics.

Wherever you operate gasoline- or LP gas-powered engines indoors — even part time — the OCM Catalytic Exhaust means an end to fume-caused headaches, eye irritation, and nausea. It means more efficient use of equipment, plus greater employee productivity and morale. Write now for complete information and the name of your nearest supplier.

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STATIONARY ENGINES

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New OCM Dieseler reduces below objectionable levels harmful, irritating exhausts from any 4-cycle diesel engine when running at or over 60% load. Write for details.

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pneumatic components and controls—as well as a general understanding of what can be accomplished through electronics.

d. Be thoroughly familiar with product design principles and characteristics of product materials.

e. Know competitive and related production processes.

f. Be able to use past experience and knowledge only as bases upon which to develop new concepts and procedures.

g. Have the ability to put ideas across to management.

Requirements for Automatic Handling

Here, in summary, are the conditions that will be required for effective automation in any kind of plant:

a. Mechanization will start, at the latest, with the receipt of raw materials. Whenever possible, arrangements will be made at the vendor end to prepare materials for automatic handling at unloading.

b. The system will integrate all machine, assembly, finishing, packaging and shipping operations.

c. The handling system will hold onto the part throughout all operations, subjecting it to complete mechanical control.

d. Inspection or gaging will be automatic after each major operation, with no loss of time.

e. Machine or process activity will be capable of instant—preferably automatic—adjustment when a drift toward unacceptable limits is detected.

f. Production of unacceptable quality will be automatically rejected, counted, and recorded for inventory and

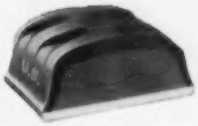
From Timken-Detroit Axle Division, Rockwell Spring and Axle Company comes this statement:
"In our Forge Shop—Plant No. 2, where the floor surface is extremely rough, we used to wear out a set of industrial truck tires in only two months. Then we switched to the U. S. Royal Innacush. *These* tires haven't been changed in *six* months and still show very little wear..."
U.S. INNACUSH

Far Less Cost-Per-Hour

assured by this softer-riding tire!

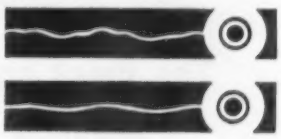
Leading industrial truck users have found that the exceptional performance of U. S. Royal Industrial Tires is saving them money.

For example, this U. S. Royal Innacush has a double-tread, an exclusive "U. S." construction feature. Outside—it's tough, for longer tread wear. Inside



-it's resilient, for exceptional shock absorption and softer riding.

With these advantages, the tires last far longer, and the equipment and load are less subject to destructive shocks and jolts. Compare these two illustrations. The jagged line on top—representing the motion of a truck's axle—shows how an ordinary tire conducts shocks. The bottom line shows the Innacush on the same route, sponging up floor irregularities.

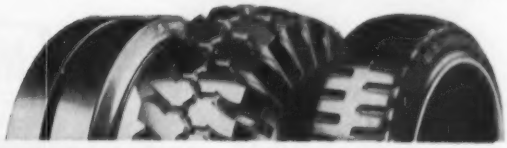


Why not let the Innacush lower *your* cost-per-hour? It comes in two types—the regular pressed-on version or the new *Demountable* Innacush you can change in 10 minutes *without* pressing charges and costly down-time!

U.S. ROYAL INNACUSH

the original cushion solid

U. S. Royal makes a complete line of industrial tires



For further information, write Industrial Tire Dept.,

UNITED STATES RUBBER COMPANY

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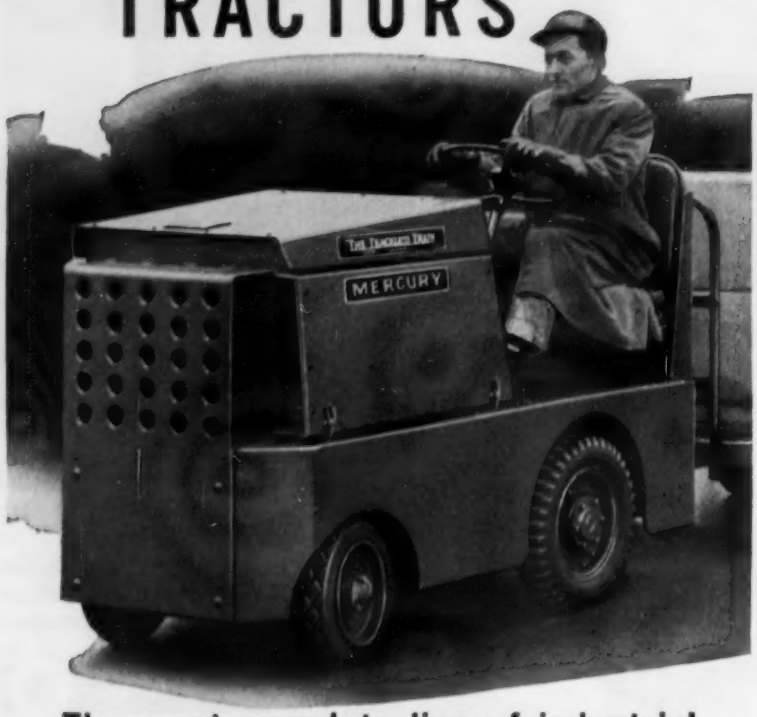
MERCURY
TRACTORS



The most complete line of industrial Gasoline and Electric Tractors

No question about it! The Mercury tractor-trailer method is the outstanding *low cost* producer for horizontal handling of materials. As originators of the "TRACKLESS TRAIN" system, Mercury offers you over 44 years' experience in the design, manufacture and installation of handling equipment . . . the most complete and versatile line of tractors and trailers. Tractors include the "Tug" Electric Model and the "Banty" (shown above) Gasoline Model, both available in various capacities, in either 3 or 4 wheel type, with cushion or pneumatic tires. For extra heavy duty the "Huskie" and "Super-Huskie" Gasoline Tractors offer the user the most dependable and economical service. Gasoline models also available with LP gas fuel systems.

Learn how the Mercury "Trackless Train" can speed material movement and lower cost in your plant. WRITE TODAY!

"TUG" Model 550 Electric Tractor. Economy is the outstanding feature of Mercury tractors. Designed to withstand severe service, construction features of Mercury tractors cut maintenance costs to a minimum . . . yet the initial investment is surprisingly small.

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FORK TRUCKS · TRACTORS · TRAILERS

MERCURY MANUFACTURING COMPANY
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Continued

production control purposes.

g. Controls will be powered by electricity, hydraulics, pneumatics or combinations of these—all operated from a central console or master panel.

h. Cycling of every individual machine or process will be controlled to keep lines balanced.

i. Selection of production machinery will be made, along with normal considerations, on the basis of its adaptability for integration into combinations with other machinery, as well as ease of arrangement in compact, efficient production lines.

It would take more than these few topics to cover the potential in automation. If we were asked to summarize some advice for the future we would set it up like this:

How to go out of business:

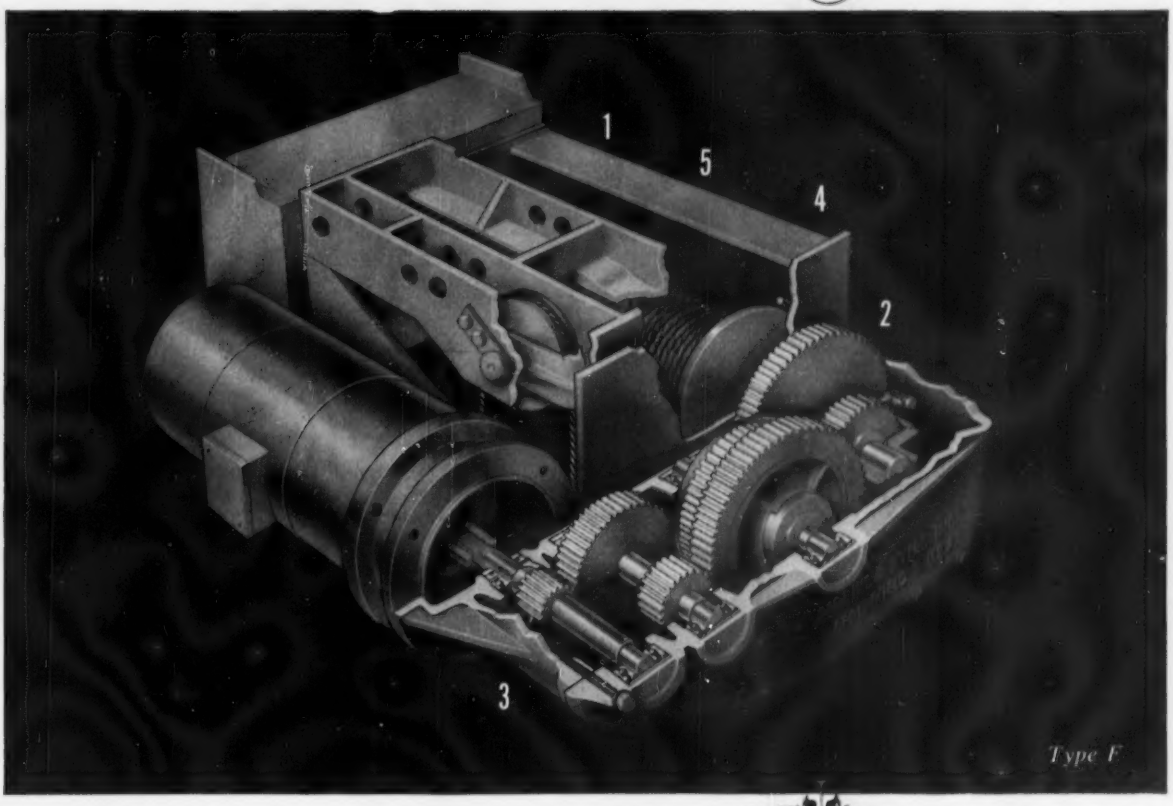
1. Have an established, unalterable product design.
2. Have a strong tradition in manufacturing methods and know-how.
3. Have an established, inflexible production facility.

How to prosper in business:

1. Avoid competing in the same labor market, with the same machinery, the same methods, and the same costs as other firms in your type of business.
2. Give your engineers a chance to use their imaginations. If they're too steeped in company tradition to come up with any really new thinking, retire them and hire or buy some engineering imagination.
3. Be unconventional with methods and machines.

Management and engineering can be certain that we are rapidly reaching the time when all manual material handling will be completely supplanted by mechanized handling.

That is to say—there will be no handling, as we think of it today.



HOW "PATH OF STEEL" CONSTRUCTION SAVES YOU MONEY

Lift and move loads up to ten tons—and spend less on repairs, less on maintenance—with the lasting extra strength of Robbins & Myers' *all steel* "F" Hoists.

Check these points—from trolley to hook—

1. Electrically *welded steel frames,* solidly braced.
2. *Alloy steel* gears.
3. *Alloy steel* shafts, with ultimate tensile strength of 278,000 lbs. psi.
4. Drums of *heavy steel* pipe, with *steel* flanges, or, in larger models, of *solid* castings.
5. *Plow steel* wire rope, pre-formed, with 6 x 37 stranding, lubricated hemp center—extra flexible, extra strong.
6. *Steel* casting hook block, drop forged *steel* hook.

Send for full specifications—no obligation.

Bring your R & M hoist data files up to date. Send for free bulletin.

☐ Send Bulletin No. 801C ☐ Have Representative call

VENTILATORS MOYNO PUMPS HOISTS CRANES MOTORS FANS

ROBBINS & MYERS INC.

SPRINGFIELD, OHIO | BRANTFORD, ONTARIO

Circle No. 249 on Reader Service Card for more information

The bonus in the bucket

Watch this demonstration of the MICHIGAN Bonus

1. 300% Torque Multiplication

Watch the powerful crowding action—forcing the bucket into the pile. The Clark Torque Converter provides that smooth, shockless power—as resistance increases, you get more torque automatically—*up to 300 per cent.*

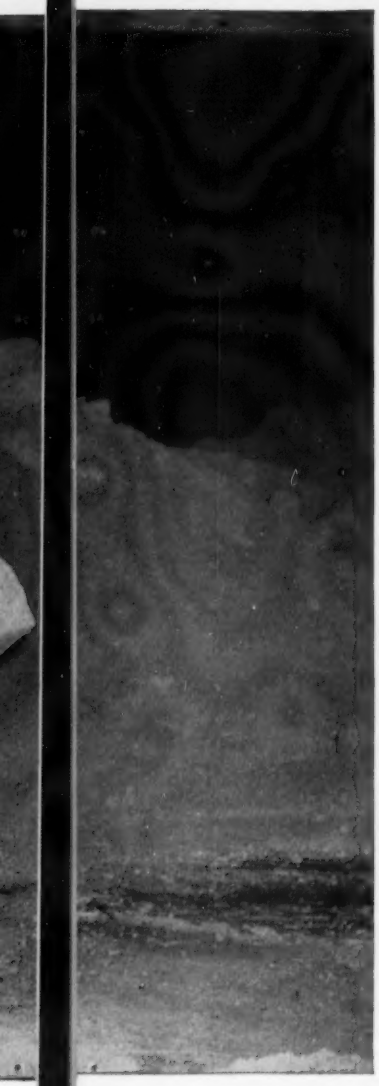
2. Terrific Break-Out Power

Get the bucket-blade into hard-to-dig material, or under a heavy obstacle, and loosen it by "working the bucket"—the two double-acting hydraulic cylinders are actually powerful enough to pull the back wheels off the ground.

3. Low Level Bucket Action

At a height of only 3 feet, you can tip the bucket back with a full load. Low-level bucket action is independent of boom hoist. You can travel a full load at low-level—with excellent visibility and stability, and you *won't* spill the load.

pays for this machine fast!



Capacity is strictly a matter of how much you can pick up in the bucket — NOT how much is printed on a specification sheet.

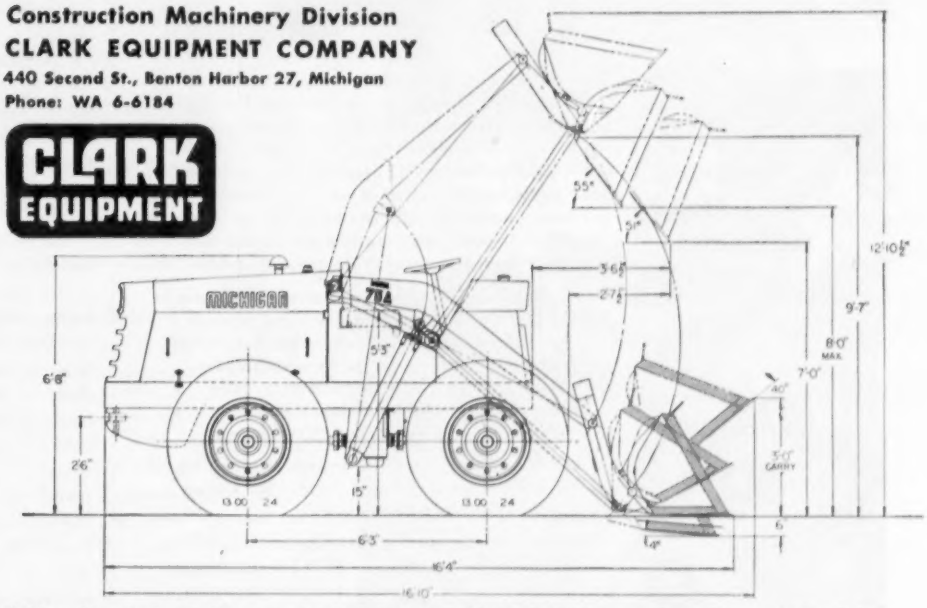
Take a close look at the bucket in the photograph. It shows a typical MICHIGAN bucket load, heaped-up well over the 1-yard *rated capacity* of this Model 75A. There's nearly a 100% bonus in the bucket—and that's a major reason why a MICHIGAN pays for itself fast.

You simply move more with a MICHIGAN! With its powerful independent bucket action, you can *dig* your way into a pile of tough material. Low-level bucket tip-back enables you to get a full bucket-load even when the pile is only a few inches high. With a MICHIGAN, you come up with a bonus in every bucket — bonus tonnage that pays for this machine *fast.*

Two outstanding features combine to give you bonus yardage on a MICHIGAN. The Clark-built power train, with torque converter and power-shift transmission, gives you more cycles per hour; MICHIGAN bucket action puts more material in each bucket load. For a demonstration, on your own job, if you wish, call your local MICHIGAN distributor, or write or call us direct. And ask for details on the low cost MICHIGAN Lease Plan.

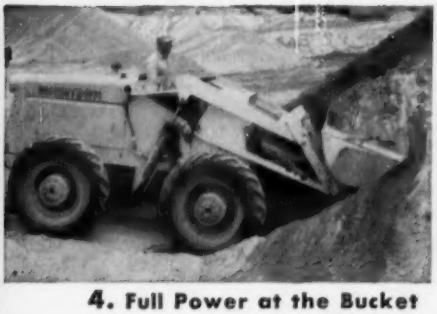
Construction Machinery Division
CLARK EQUIPMENT COMPANY
440 Second St., Benton Harbor 27, Michigan
Phone: WA 6-6184

CLARK EQUIPMENT



Multi-position Bucket Action: note the shaded area of this Model 75A range chart. From 6 inches below ground-level, two big double-acting bucket cylinders pull the bucket back to a 40-degree carrying position at a height of only 3 feet. The operator has precision control over this independent bucket action.

Bucket



4. Full Power at the Bucket

Step on the brake and automatically put the transmission in neutral—the full hydraulic power goes into the bucket cylinders. Accelerate for faster bucket action and this automatic neutral takes the load off the brakes and torque converter.

5. Look—No Clutch!

Watch the driver *change direction while moving*—by flipping the easy hand-lever on the steering column. There's no clutch pedal on a MICHIGAN—the torque converter and power-shift transmission takes all the work out of gear-shifting.

6. Easy to Drive

Operate the boom and bucket controls with the right hand and spin the steering wheel effortlessly with the left—hydraulic power does the muscle work.

Circle No. 90 on Reader Service Card for more information

$41,400 Annual Savings with RCA 2-Way Radio

. . . is Clark Equipment Co.'s Estimate of Value of Increased Manpower Efficiency and Reduction in Lost Production Time

RCA 2-Way Radio in this trailer train facilitates dispatching "hot" materials, tools, supplies, throughout entire Clark plant at Battle Creek, Mich.

Dispatcher receives call for service in Manufacturing division and gets truck to request point without delay.

Truck deliveries for Assembly division are in response to direct request from foreman.

Two systems are in use: In servicing the Assembly division, *direct radio contact* is provided between division supervisor and truckers—thus eliminating ten to thirty minutes of paper work and up to four individuals to execute it. Tangible savings have been gained to the extent of approximately $24,000 per year. Another $2,400 in intangible savings is estimated through reducing lost production hours that were caused by waiting for material deliveries.

In the Manufacturing division, more efficient use of both equipment and personnel is being made through radio-dispatched trucks. This has solved the problem of transportation shortages due to fluctuation in peak loads, by permitting close cooperation with other operations, resulting in a saving here of approximately $15,000 a year.

RCA 2-Way Radio is used in a total of nine fork-lift trucks and one towing tractor, with four station units over a ½-mile plant radius.

Have you investigated the advantages of RCA 2-Way Radio for your plant? RCA famous-quality mobile units fit almost any convenient location, require a minimum of maintenance, permit quick servicing when needed. The RCA Service Company provides nation-wide service facilities if desired. Why not get complete information now?

RADIO CORPORATION of AMERICA
COMMUNICATIONS EQUIPMENT **CAMDEN, N. J.**

Radio Corporation of America
Dept. R-131, Building 15-1, Camden, N.J.
In Canada: RCA VICTOR Company Limited, Montreal

☐ Please send information on RCA 2-Way Radio For Materials Handling.
☐ Have an RCA representative get in touch with me.

NAME _____ TITLE _____
COMPANY _____
ADDRESS _____
CITY _____ ZONE _____ STATE _____

Circle No. 241 on Reader Service Card for more information

(*Continued from page* 108)

structed, decorative bridges. It would be unnecessary for an office worker or shopper to descend to street level until he or she picked up the family car back at the parking lot.

The same conveyors could be used after hours to deliver packages and freight to downtown stores. Purely freight conveyors could be used to bring in merchandise and supplies from outlying rail, truck and air terminals. These will work satisfactorily either below ground in relatively small tunnels no larger than needed for truck sewers—or they could go overhead on light, airy structures designed to blend well with the architecture of the areas through which they pass. The city of the future must use several levels of transportation or decentralize to the suburbs almost completely.

Idea Not New

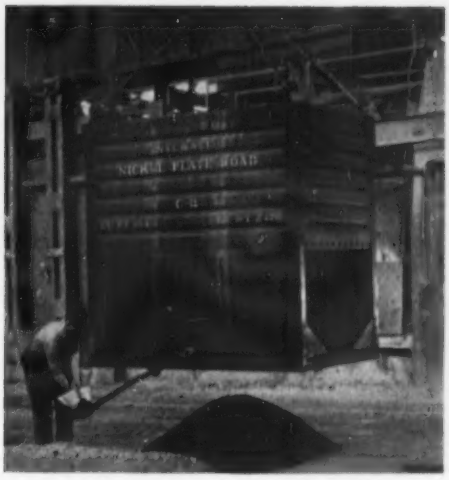
Handling people on conveyors has been common in industry for many years. Workmen ride on conveyors paralleling assembly and inspection operations; foundrymen pour thousands of tons of castings daily while riding on pouring walks synchronized to the speed of continuous mold conveyors. Conveyors within a plant carrying people only for the sake of expediting movement would seem to be a practical consideration in these days of acres of floor space under one roof and portal-to-portal pay.

The interminable climb up and back down the ramps of a stadium or ball park may be a thing of the past with the installation of reversible, inclined moving sidewalks; super-markets will bring customers in from their super-parking lots, and then take their bundles and them out to their cars. One suggestion has been made that a conveyor simply take the customer's car, park it, and bring it back when milady is ready to take the groceries home.

Space for downtown parking may be practical if limited access speedways can be built to bring commuters into town without

Know These 2 Basic Types of Youngstown Bulk Materials Containers

Discharge of bulk material from controlled discharge container.



Shut off of discharge of material.

LOOK beyond their sturdy long lasting steel bodies and discover their built-in characteristics and cost which make them a must for your plant.

ASCERTAIN how they eliminate rehandling of bulk materials from source to final disposition.

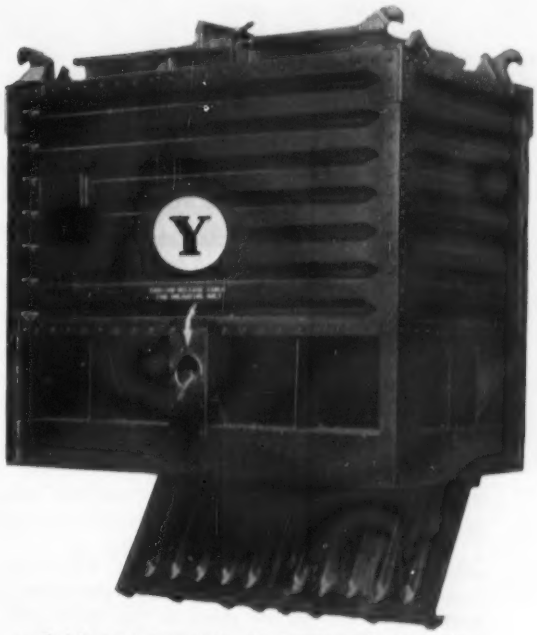
LEARN how the basic controlled discharge container enables you to discharge the quantity of material you desire and then shut off the flow by means of an easily operated gear actuated rotary valve. The gears are housed and completely protected.

DISCOVER the ease with which the discharge door on the bottom of the basic drop bottom container can be released to quickly and completely discharge the bulk materials it carries.

PERCEIVE the action of the lock which securely and automatically locks the discharge door in the closed position when the container is placed upon the ground.

DISCERN that with ordinary care these containers will reward you with many years of faithful, repair-free service, save valuable time and drastically cut your material handling costs.

RECOGNIZE the flexibility of design of these containers which enables them to be built to your specification and size. In these accomplishments we work closely with you and place the experience and know-how of our engineering staff at your disposal.



Quick and complete discharge Bulk Materials Container with Bottom Discharge Door open.

Consult with Us for Improved Handling of Your Bulk Materials

THE YOUNGSTOWN STEEL DOOR CO.

Camel Sales Company • Camel Company Limited

CLEVELAND • CHICAGO • NEW YORK • YOUNGSTOWN

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CHICAGO TRAMRAIL

TRAK-RAK cuts cost of

BAR STOCK HANDLING 66.3%

employing 2 men where 4 were formerly required . . . with 100% selectivity of material

An improved, simplified, and radically different method of handling bar stock is now in use which replaces the usual difficult and costly method of storing bar stock in pigeon hole racks and removing only a bar or two at a time.

Utilizing the TRAK-RAK Crane System, bar stock is assembled in unit loads placed in containers or baskets which are stored in fabricated tree-type racks on each side of narrow aisles. To remove one or more bars, the container is lowered to the floor, the bars removed and the container with the remaining bar stock placed back in its designated location in the storage racks. The entire movement is one-man, pendant push-button controlled from the floor and it is now possible for the saw man to select his own material and place it directly upon the saw table.

This TRAK-RAK Crane System operates in a 4 ft. 6 in. aisle and stores the material eleven high. The same crane incorporates interchangeable forks which allows the crane to handle palletized material as well as bar stock in the same area.

Write today for TRAK-RAK applications —a 20-page illustrated booklet explaining the TRAK-RAK Handling and Storage System; illustrates and describes installations for handling many diverse materials in fourteen widely different industries.

CHICAGO TRAMRAIL CORPORATION

1322 SO. KOSTNER AVENUE • CHICAGO 23, ILLINOIS

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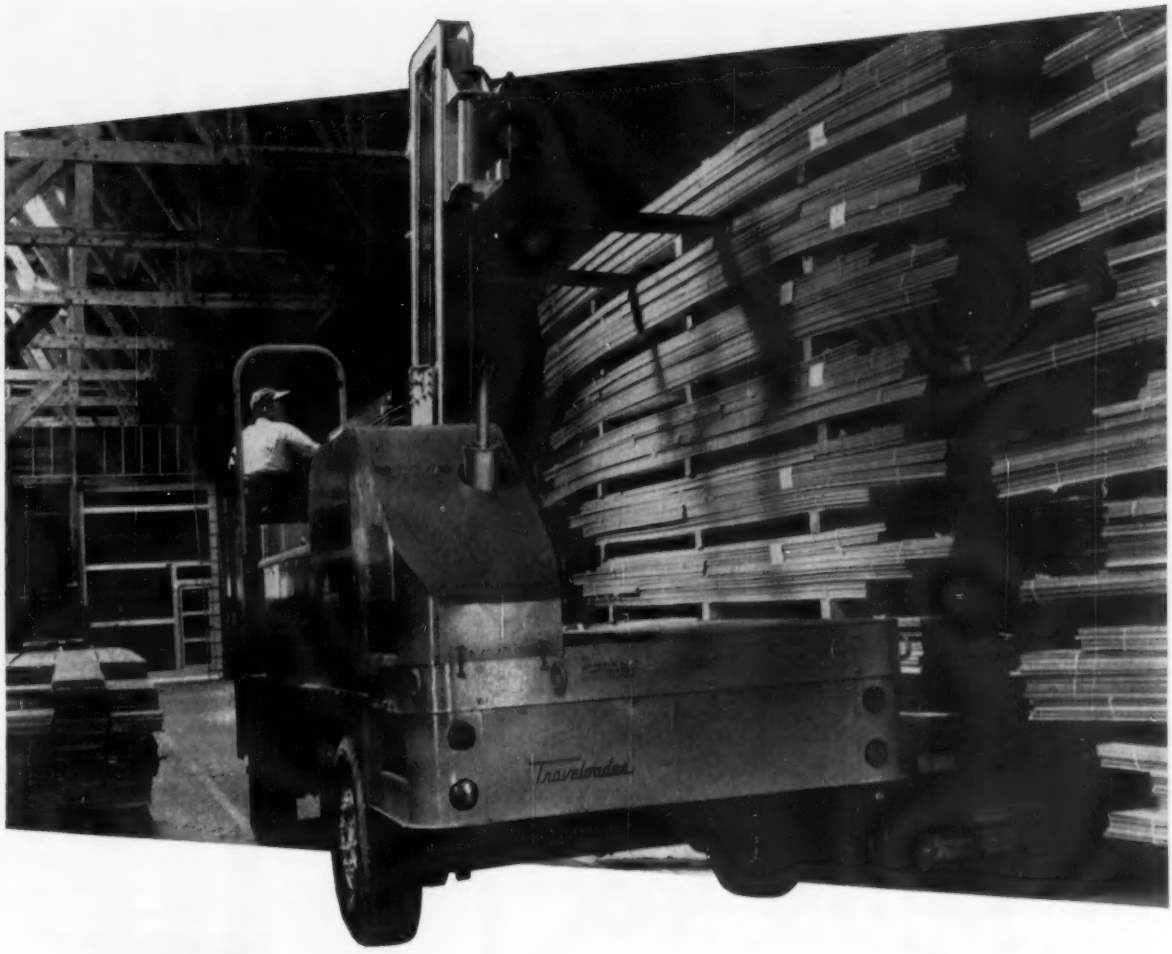
cross-traffic congestion. Such space may be underground beneath parks, public squares, or under business blocks and where enough room is found to take care of the influx of cars. The lot is apt to be of such size that moving sidewalks will be necessary to move people from their cars to their downtown destinations.

Ramps and moving stairways will take care of parking on several levels where such schemes can be worked out. In other areas, pigeon hole parking is already a reality where conveyors take over from the time the driver steps out of his car until it is delivered to the exit for him. Room for such off-street, multi-story, parking facilities can be found easily in most cities if the problem of getting the cars downtown can be licked.

No Delay

Emancipation from the redcap and skycap will come with passenger conveyors along train platforms and from plane ramps. Such conveyors will carry both passengers and their baggage from trainside or planeside to taxi stands. Other conveyors could deliver them directly to nearby hotel lobbies. At airports, conveyors may move the whole plane sidewise or endwise to a loading area protected from the weather with a saving in space that would permit more planes to dock at a time at a busy airport. The same conveyors would deliver the loaded plane to a clear taxiway without having to jockey wing tips past wing tips of other planes. There are conveyors in every-day operation which could be used in handling the largest plane as easily as baggage belts would bring bags and freight to the baggage counter in a fraction of the time now spent standing on one foot then the other while waiting the long, dull minutes for your baggage to be manhandled from the plane.

Where distances are great and where stairs must be climbed, other conveyors will bring the passengers themselves direct from the plane door to the baggage delivery



Traveloader* stacks 20-foot lumber from 10-foot aisles!

Barberton Wholesale Lumber Company uses a Baker Traveloader* to make good on its slogan "*Fastest Wholesale Lumber Service in Ohio.*" Its two 80 x 180 ft. warehouses, using the Traveloader* system of straight line pick-up and delivery, require only 10 foot aisles. Packaged 20-foot long lumber is all tagged, indicating number and dimensions of boards and number of board feet per package (from 500 to 4000). "*With advance notice*" says I. R. Yeater, Mgr., "a receiving truck can be loaded and gone in 15 minutes using only one machine and one operator!"

Traveloader* can be used for many other operations besides stacking and loading lumber. With its several attachments it serves as yard crane, strip steel carrier, multiple pallet mover, side-loading fork truck and transporter. Write for full information. The Baker-Raulang Co., 1219 West 80th Street, Cleveland, Ohio.

*Trade Mark

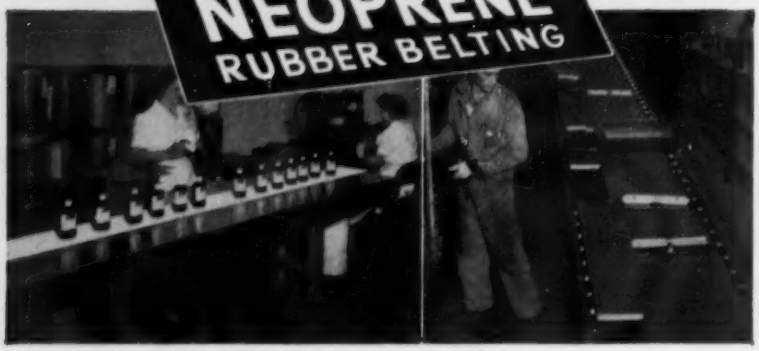
Baker.
handling equipment

Circle No. 74 on Reader Service Card for more information

built to combat

OILS OR GREASES
ACIDS OR ALKALIS
FLAVORS OR ODORS
COLD OR HEAT
DUST OR DIRT

GLOBE NEOPRENE RUBBER BELTING



• Improved "thin-ply" belting with square edge, minimum stretch, positive traction, smooth surface and excellent flexibility, is taking the lead for conveying and power transmission. This belting is engineered by Globe for specific needs. Ideal for heavy industry or assembly plants, Globe's Black Neoprene Rubber Belt resists abrasion, oil, greases, acids or spillage that affect ordinary rubber belts. For the food handling industry, Globe's White Neoprene Rubber Belt and Hycar Rubber Belting resists organic and inorganic chemicals that have a marked effect upon natural rubber belts. For the textile, tobacco or other similar industries, Globe's Brown Neoprene Rubber Friction Surface Belt is valuable for many transmission operations. This belt is equally valuable for normal conveying operations where rubber covers are not required.

BLACK OR WHITE CONVEYOR BELTING —
for oily conditions or where combined heat and oil are encountered. High abrasion resistant 3/64" top cover, friction bottom.

WHITE OR BROWN BELTING —
friction surface top and bottom for transmission and conveying purposes.

WHITE OR BROWN RUFF TOP CONVEYOR BELTING —
for incline and decline conveyors.

WHITE HYCAR RUBBER BELTING —
for severe grease conditions, quick freeze temperatures, and above average heat conditions.

CLEATED BELTING —
with rectangular, crescent or U-shaped neoprene cleats vulcanized securely into the belt for conveying on severe inclines.

CUSTOM MADE BELTING —
cut to your exact width and length. All belting can be made endless at our plant or on the job by vulcanizing or cementing and air drying at room temperature.

WRITE FOR
"GLOBE NEOPRENE RUBBER BELTING CATALOG"

GLOBE WOVEN BELTING CO., INC.
1400 CLINTON STREET • BUFFALO 6, NEW YORK

KNOWN FOR QUALITY THE WORLD OVER

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counter. Conceivably, with a well devised handling system, the passenger would find his baggage had arrived ahead of him. It makes little sense to spend more time waiting than flying, as is often the case on short hops.

While I have the greatest respect for a truck driver who can jockey a semi-trailer as big as a house into a space that would scare the average passenger car driver out of his Hydromatic complacency, I wonder if time and space might not be saved in sufficient amounts to warrant adapting the merry-go-round or turntable conveyor to truck and trailer docking? This idea has been used at one small bus terminal I have seen, but why wouldn't it save space and time in measurable amounts in a big terminal as well?

Use To Be Expanded

Self-unloading trucks and railroad cars in which conveyors are incorporated have been with us for some time. I expect to see this use of conveyors expand as the needs for shorter turn-around time become more urgent along with split-second timing of production and minimum in-plant storage facilities. Where trailers serve as mobile warehouses, plant conveyor lines may extend right into them or connect with truck mounted unloading conveyors.

Self-unloading ships for bulk materials are the rule rather than the exception on the Great Lakes. An approach to self-unloading ships carrying general freight would seem to be a problem that must be solved by teaming the material handling engineer with the marine architect to produce both ships and docks of the future that will eliminate hours and even days of time spent moored in port. For single commodity ships this should present no great problem.

My guess is that the automatic pallet-loader will come into widespread use, and it may find an application on a dock palletizing cased goods from the ship. It isn't hard to envision greater use of relatively inexpensive conveyors for horizontal and inclined trans-

2000 lbs.
1500 lbs.
1000 lbs.
500 lbs.
100 lbs.

ARO

Variable Speed

AIR HOIST

Variable Speed . . . 1000 lbs., 0 to 38′ per minute . . . 2000 lbs., 0 to 20′ per minute . . . load can be inched or zipped.

AIR-powered for Safety . . . no spark hazard . . . explosion-proof motor . . . can't burn out . . . can't overheat . . . unaffected by dust or fumes.

Lightweight . . . only 28½ lbs. for 1000 lb. hoist . . . 2000 lb. hoist weighs only 47 lbs. Overall length all models, 10½″ to 11⅛″.

SEE YOUR ARO DISTRIBUTOR

THE ARO EQUIPMENT CORPORATION
Bryan and Cleveland, Ohio

Aro Equipment of California, Los Angeles, Calif.
Aro Equipment of Canada, Ltd., Toronto 1, Ontario
Offices in All Principal Cities

ARO® AIR HOIST
Also . . . Air Tools . . . Lubricating Equipment . . . Aircraft Products . . . Grease Fittings

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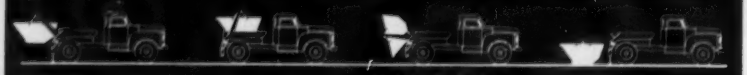
One truck does the work of many!

THE BROOKS **LOAD LUGGER**®



picks up hauls dumps puts down

WHAT IT IS

The BROOKS LOAD LUGGER is a flat-bed truck body with a pair of hydraulic-powered hoisting arms, which is mounted on any truck chassis of suitable capacity. Standard models lift pay loads of up to 18,000 pounds at a time. Some special-purpose models lift much heavier pay loads.

LOAD LUGGER CONTAINERS are patented, tilt-dumping containers with deep, leak-proof bottoms. Capacities range from 1½ to 14 cubic yards for standard models. Some special-purpose models are much larger. A variety of open and closed containers handle solid materials, powders, sludge, liquids, and gases. Special pallets handle free-standing and unit-packaged materials.

Controlled by the driver from his cab, the truck-mounted Brooks Load Lugger lifts a Load Lugger Container onto its steel deck, carries it well forward for correct load distribution, cradles it between steel sidewalls for travel safety, hauls it away, dumps or spreads its contents, then returns the container and puts it down.

HOW IT IS USED

The LOAD LUGGER SYSTEM of materials handling calls for a number of Load Lugger Containers to be placed at points of need. These containers collect material as it accumulates, which reduces handling and eliminates loading crews. Then, loaded containers are picked up, hauled away, dumped, and returned on a regular schedule by a truck-mounted Brooks Load Lugger, which replaces many conventional trucks and eliminates loading time formerly required.

WHO USES IT

Industrial operations all over the country (quarries, foundries, steel mills, paper mills, refineries, chemical plants, brick plants, metal fabricators, etc.) use this versatile equipment to handle raw materials, finished products, and waste materials. Contract haulers of wet and dry refuse prefer Load Lugger equipment, as do scrap metal dealers, construction contractors, cemetery operators, and sugar cane growers. Government approval is evidenced by the many municipal, state, and federal installations. New uses and new users, such as cable reel handling by power and telephone companies, are constantly coming into the picture.

WHY THEY LIKE IT

The Brooks Load Lugger has no cumbersome superstructure or extra operating gadgets because of its patented simplicity, clean design, and sturdy construction. This results in a lower first cost, lower maintenance costs, the ability to carry more pay load on a given truck chassis, and a clear deck for multipurpose use. Its double-acting hydraulic cylinders, four-point container suspension, secure container cradling, and fully controlled tilt dumping are important contributions toward greater operational safety.

Load Lugger Containers are job-designed and job-proved. They are low and easy to load to full rated capacity. They dump clean because they are tilt-dumping, and they have no bottom openings to allow messy or insanitary leakage. Appropriate models are dust-proof, rat-proof, fly-proof, and almost odor-proof.

BROOKS EQUIPMENT & MFG. CO. 7031 DAVENPORT ROAD KNOXVILLE, TENNESSEE

Circle No. 76 on Reader Service Card for more information

portation of loaded pallets to and from storage areas—where they are teamed with industrial trucks, cranes and hoists to provide a speedy, highly efficient warehousing operation.

A companion machine to the pallet-loader would be a pallet-unloader. Perhaps this has been designed already, but, if not, it should be. Every pallet loaded has to be unloaded at some time and, often, in a minimum of time.

All this brings us to the automatic warehouse with automatic storing and automatic order picking. This can be worked out even for warehouses with a considerable variety of stock items. There are a number of fanciful ways in which such a warehousing operation can be worked out. There are some practical ways in which conveyor dispatching systems, gravity or roller storage racks, and other devices designed to handle ounces or tons can be utilized to minimize manhandling.

In numerous instances, I believe that redesign of the product, careful attention to handling and transportation may result in the elimination of the expense of packaging.

About Automation

In manufacturing, "automation" is a new word for an old process. I have a reproduction of an ad back in 1791 in which Oliver Evans described the advantages of conveyorized flour milling—an application of automation principles to the processing of a bulk commodity. Automation must grow and will often take the form of an adaptation of a conveyor.

Automation for the sake of automation would be a great mistake in many processes. To achieve the best results, I believe that automation must necessarily start with consideration of product redesign with automated processes in mind during every step of that redesign. Not many products as we know them would be suited for economic automation. Conveyors will be used as component parts of many processing machines, and their use as processing machines in themselves

Less Idle Time

WITH

MOTO-TRUC*

* To make an investment in a lift truck is one thing . . . to make it *pay* is another. The amount of idle time logged against a truck is a major factor in whether a truck is "paying its way."

MOTO-TRUCS offer *LESS* Idle time because of simplified operator controls. Their patented *Roller Grip Controls* make it easy for practically anyone in your plant to operate the truck . . . and remember . . . There's a MOTO-TRUC for every purpose.

Simplified Roller Grip Controls

Send for Bulletin No. 54

MOTO-TRUC Designers FOR THE INDUSTRY PATENTED

The MOTO-TRUC Co.

Representatives in Principal Cities

1955 E. 59th St. • Cleveland 3, Ohio

Pallet . . . Platform . . . Hi-Lift Trucks

LARGEST EXCLUSIVE MANUFACTURER OF "WALKIES"

Circle No. 213 on Reader Service Card for more information

SAVE TIME...SAVE MANPOWER...
REDUCE ACCIDENT RISK WITH—

MINIMAX
Pusharounds

FOR LIGHT MANUFACTURING

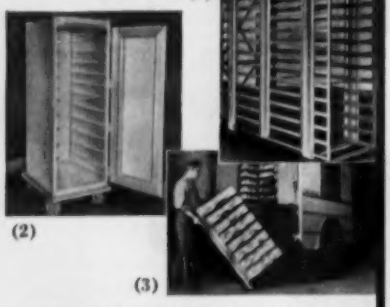
Factory push-vehicles that carry lightweight parts and materials sometimes weigh more than the loads they carry. This B&P Shelf Truck carries a cargo for an electrical product assembly line. Shelf Truck models weigh from 37 to 78 lbs. This model, also Platform and Bin Trucks, are available for 500-lb. and 1200-lb. loads.

They are made of Magnesium the lightest weight structural metal. Steel is four times heavier; aluminum is 50% heavier.

Pusharounds are rugged and durable. They won't rust. Unaffected by alkalis, they are easily cleaned. They cut dead weight sometimes as much as 75%. This may mean a single pusher where two were needed—or a girl pusher instead of a man.

Magnesium Pusharounds were originated by B&P. They save important money in many applications, many industries. B&P makes many standard models such as those shown here; "specials" can be made up reasonably.

(1)



(2)

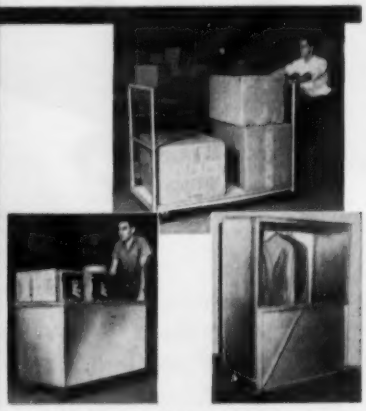
(3)

THREE MODELS FOR BAKERIES

(1) SAVES TWO TONS IN A TRAILER LOAD! Magnesium Bakery Transfer Rack for long distance hauls weighs only 179 lbs.; replaces similar steel racks weighing 450 lbs.

(2) NO DUST—NO DIRT—NO FLIES. Lightweight Magnesium Bakery Delivery Cabinet carries trays for unwrapped cakes, cookies, rolls. Easily handled by the truck driver making plant - to - store deliveries.

(3) EASY ON THE DRIVER. This Hand Truck weighs only 21 lbs.; same truck in steel, more than 75 lbs. It folds and stows flat.



FOR DEPARTMENT STORES

Here are three of several models, all so light that they are easily handled by a girl. Garment rack Pusharounds stay on the retail floor. Transfer trucks instantly merchandise from warehouse to store, available with or without locks.

Send for this B&P file folder. **It contains specification sheets on standard models.**

Distributors in Principal Cities

BROOKS & PERKINS, INC.

1944 West Fort St. • Detroit 16, Mich.

Circle No. 75 on Reader Service Card for more information

will increase greatly as "effortless labor" approaches reality.

Paper work is the bane of existance for most managements. In the office, I expect to see close attention to the elimination of as much paper as possible. And what is left will be distributed via conveyors, pneumatic or mechanical, according to the needs. The kid with the sack that I used to call "Mercury"—mostly because he was not a "winged messenger"—will be put to work doing something productive. Large offices are finding electronic devices and conveyors invaluable as a team to speed paper work on its way and to eliminate sources of error, and, as usual, improvements made in large operations will be adapted to the smaller with substantial economic gains.

"Mechanical pipelines" in the form of long distance belt conveyors must take their place as common carriers wherever the twin factors of a continuous supply of a material at one end matches a continuous demand at the other end. There is every reason to expect this development in the comparatively near future.

These mechanical pipelines will be the means of bringing out raw materials from inaccessible areas where they are usually deposited by old Mother Nature without consideration for man's convenience. Belt conveyors will dive through mountains, climb steep grades, soar across ravines and rivers to bring out these vital materials to convenient processing plant sites. They will do this with a fraction of the installation and operating costs of any form of batch transportation.

Atomic Power

Packaged atomic power or solar power plants will take care of the modest power requirements of the belt conveyor lines, thus making them practical for operation in areas far from power supplies. Where down grades are encountered, conveyor motors may become generators and put back power into the lines to reduce generating requirements.

Jumping into the future with

You'll cut handling costs with ROEBLING ALL-PURPOSE SLINGS

You can have these slings with a tapered sleeve attachment with a heavy steel galvanized thimble plus the following attached fittings:

Drop Forged Steel Weldless Hook

Drop Forged Weldless Shackle

Weldless Link

THESE are the easiest-to-handle slings ever put on the market. There are no servings—no bulky sections of rope next to the loop. All wire ends are safely and permanently covered by the tapered sleeve. And on top of that, these slings are remarkably flexible, *doubly* safe, and real time-savers on the big majority of lifting jobs.

Roebling All-Purpose Slings come to you ready for work. They cost less than most other slings and they're a cinch to order. They have the full catalog strength of the "Blue Center" steel wire rope with I.W.R.C. from which they're made, assuring maximum sling service life.

Roebling All-Purpose Slings are stocked in standard sizes and lengths for immediate delivery. Order them from your jobber—and write us for descriptive folder. John A. Roebling's Sons Corporation, Trenton 2, N. J.

ROEBLING

Subsidiary of The Colorado Fuel and Iron Corporation

BRANCHES: ATLANTA, 934 AVON AVE. • BOSTON, 51 SLEEPER ST. • CHICAGO, 5525 W. ROOSEVELT RD. • CINCINNATI, 3253 FREDONIA AVE. • CLEVELAND, 13235 LAKEWOOD HGTS. BLVD. • DENVER, 4801 JACKSON ST. • DETROIT, 915 FISHER BLDG. • HOUSTON, 6216 NAVIGATION BLVD. • LOS ANGELES, 5340 E. HARBOR ST. • NEW YORK, 19 RECTOR ST. • ODESSA, TEXAS, 1938 E. 2ND ST. • PHILADELPHIA, 230 VINE ST. • SAN FRANCISCO, 1740 17TH ST. • SEATTLE, 900 1ST AVE. S. • TULSA, 321 N. CHEYENNE ST. • EXPORT SALES OFFICE, TRENTON 2, NEW JERSEY

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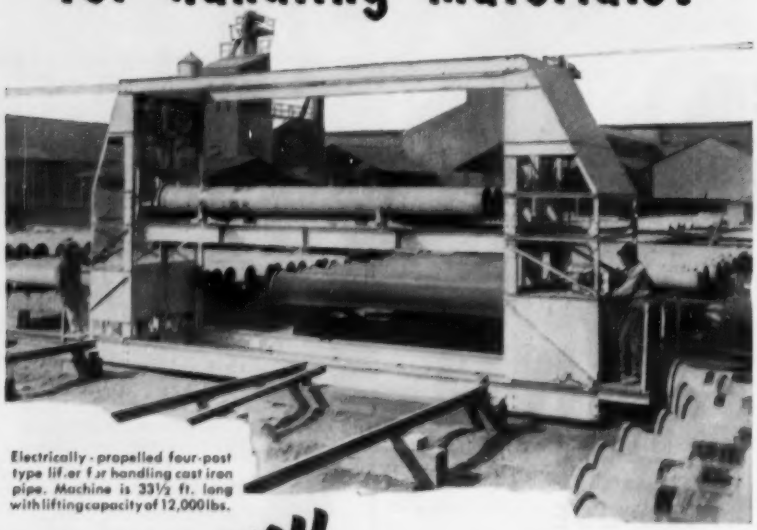
NEED A SPECIAL machine for handling materials?

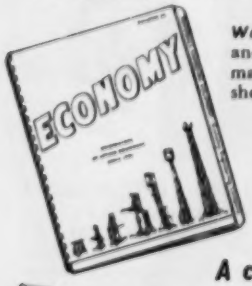


Electrically-propelled four-post type lifter for handling cast iron pipe. Machine is 33½ ft. long with lifting capacity of 12,000 lbs.

Economy will engineer and build any type of special materials handling machine to fit the job. We've done it for hundreds of companies over the past 54 years. What's your problem?

We have engineering representatives in all principal cities who will be glad to talk over your requirements and make recommendations and estimates without obligation.

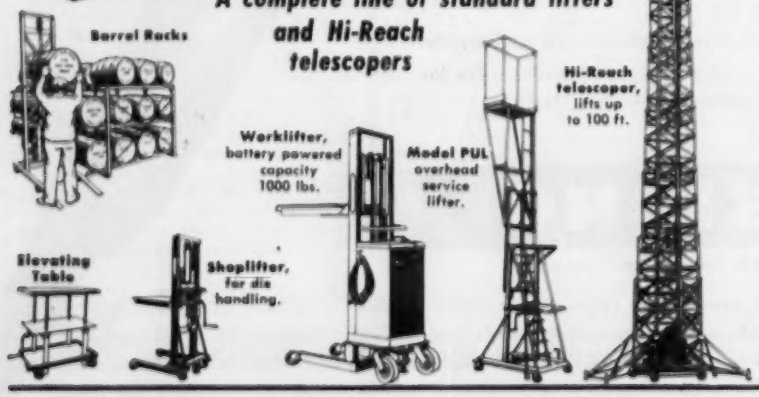
Structural strength and performance are first considerations in engineering special materials handling equipment. And you can be sure an Economy built machine will handle the job safely and economically.



Write for new Catalog No. 55. Forty pages of special and standard materials handling and overhead service machines. Every plant manager and maintenance engineer should have this catalog.

ECONOMY ENGINEERING CO.
4524 W. Lake St., Chicago 24, Ill.
New York Office, 342 Madison Ave.
New York 17, New York

A complete line of standard lifters and Hi-Reach telescopers


Barrel Racks
Worklifter, battery powered capacity 1000 lbs.
Model PUL overhead service lifter.
Hi-Reach telescoper, lifts up to 100 ft.
Elevating Table
Shoplifter, for die handling.

Circle No. 114 on Reader Service Card for more information

Continued

both feet, I will even suggest that conveyors of some sort will accompany the first serious exploring expedition to the moon. Since all oxygen must be imported, physical effort must be kept to a minimum and it hardly seems possible that any pick-and-shovel exploration could be tolerated. Because of the low gravity, power needs would be small for running operation. Slow starts would minimize power needs in overcoming the inertia of mass.

Ending on a philosophical note, I must express the hope that mechanical ingenuity will not outstrip our insight into how all of these marvelous developments must fit into our daily lives to produce the end result of a better and fuller life for all of us.

INDUSTRIAL VEHICLES . . .

(*Continued from page* 105)

loud speaker and microphone of the built-in industrial radio.

Overhead protection is part of the overall motif. The tubular structure also provides anchoring for articulated front lights, which follow the load, and stationary rear lights.

the personnel carrier

This little vehicle is designed with fiberglass in mind. The lights are protected by a plastic cover, and the folding windshield adds a sporty look. The rounded front shield permits easy entry. And the pear-shaped control handle houses the microphone of the built-in two-way radio.

the highway truck

Featured is extra visibility with the curved windshield extended into the roof and plunging down the front. The rear quarter of the cab is made of transparent plastic. Circular openings in the bumper are air-intakes, and tapered fenders house fuel and tools. The trailer features a vertical light, which identifies the vehicle miles away.

A positive new way to cut material handling cost

In many plants it is necessary to call a heavy duty two ton lift truck with a driver to move small loads weighing a few hundred pounds.

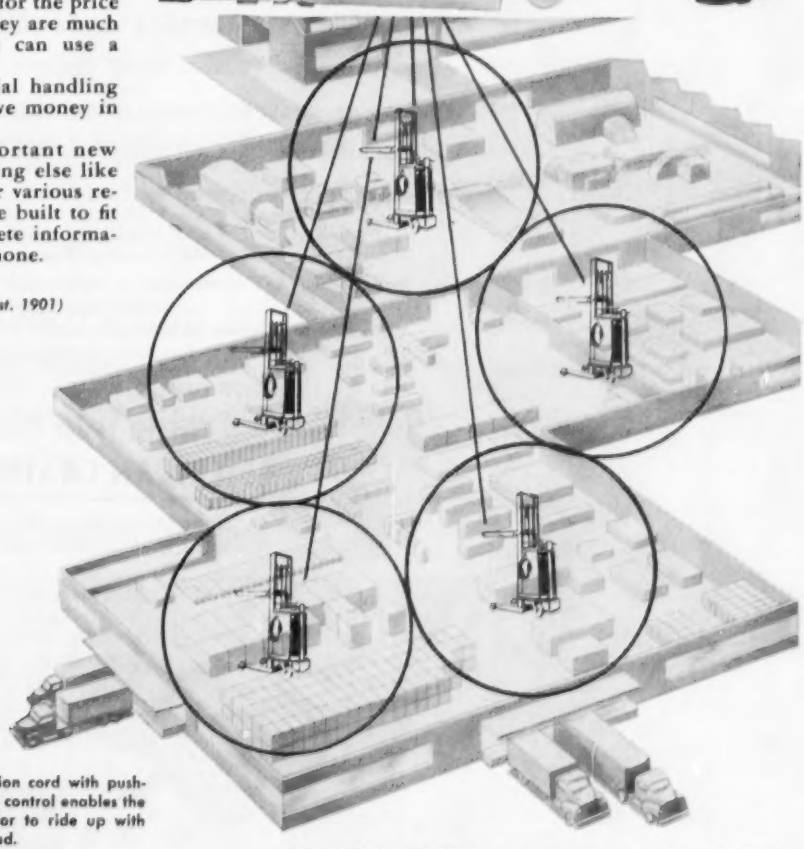
Now, you can cut this high cost method of handling small items by using a number of Economy Walkie-Worklifters stationed throughout your plant right where they are needed for light duty lifting and moving. Save the big trucks for the big jobs.

You can get 3 Walkie-Worklifters (only $1148.00 for the 60" lift model) for the price of 1 heavy duty lift truck, and they are much less costly to operate. Anyone can use a Walkie-Worklifter.

This is a new kind of material handling and traffic efficiency that will save money in many plants.

Take advantage of this important new Walkie development now. Nothing else like it. Many models are available for various requirements or a "special" can be built to fit your particular need. Get complete information; mail the coupon, wire or phone.

ECONOMY ENGINEERING CO. *(Est. 1901)*
4506 W. Lake St., Chicago 24, Ill.
Phone — EStebrook 8-9110
Eastern Sales Office
342 Madison Ave., New York 17, N. Y.
Phone — Murray Hill 2-8940
Representatives in all principal cities



Extension cord with push-button control enables the operator to ride up with the load.

Quick Facts

Walkie-Worklifter lifting capacity 1000 lbs. Welded structural steel construction — Batteries and built-in charger included.

Standard platform models have 60" lift — telescopers up to 110".

Straddle type fork models with lift up to 108".

Standard models will pass through doorways and turn sharp corners in narrow aisles.

A safety feature — just let go the handle and it stops itself on the spot with automatic brake.

ECONOMY ENGINEERING CO.
4524 W. Lake St., Chicago 24, Ill.
Attention Mr. Carl Rhodes:
☐ Would like demonstration of Walkie-Worklifter in our plant.
☐ Mail copy of bulletin.

MY NAME_____

TITLE_____

COMPANY_____

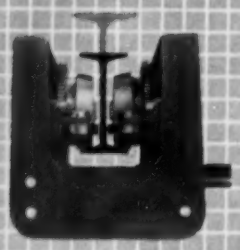
ADDRESS_____

Circle No. 115 on Reader Service Card for more information

ACCO products

These Simple Steps Show You How to Save Money on Cranes

B-516 END TRUCKS



GUIDE WHEELS

When you are confronted by a material handling problem, and the decision is to **BUY** overhead equipment, either monorail or cranes may be the solution. **WRIGHT** offers a wide variety of quality hoists, some hand and others **ELECTRIC**. For production purposes hand hoists are now being replaced by **HOISTS** powered by electricity. For the very latest design see the B-516 **END TRUCKS**. Flangeless wheels permit travel on various beam sizes, **AND** thrust rollers, bearing against the eye beam webs prevent skewing. **CRANE DRIVES** are equipped with a new design of solenoid "drag" brake and are furnished in a wide variety of travel speeds. To save freight charges . . . **BUILD** cranes locally with WRIGHT'S soundly engineered crane components. **MODERN** construction and manufacture call for Timken Tapered Bearings in **MOTOR DRIVEN** trucks and either single speed fluid drive or variable speed **CRANES**.

We will be glad to send you literature carrying full information on any or all of the following WRIGHT Crane components:

Hand Traveling Cranes—top running single bridge Bulletin #DH-468
" " " —underhung Bulletin #DH-348A
Motor Driven Cranes—underhung single bridge Bulletin #227
" " " —top running Bulletins #DH-448 or #DH-449

WRITE OUR YORK, PA., OFFICE

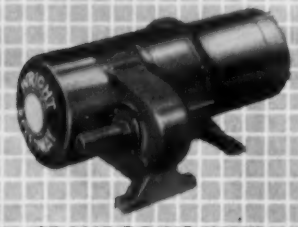
ACCO

Wright Hoist Division
AMERICAN CHAIN & CABLE

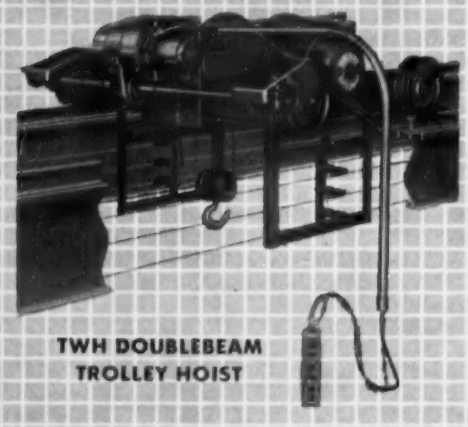
York, Pa., Atlanta, Chicago, Denver, Detroit, Los Angeles, New York, Philadelphia, Pittsburgh, San Francisco, Bridgeport, Conn.

for Better Value

B-514 END TRUCKS

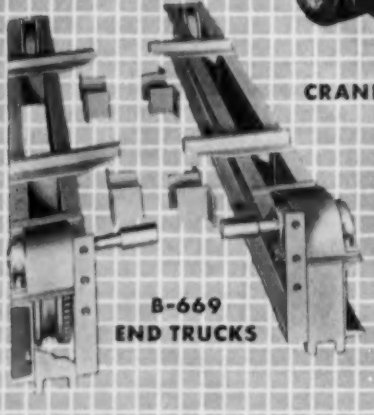


CRANE DRIVE UNIT



TWH DOUBLEBEAM TROLLEY HOIST

END VIEW



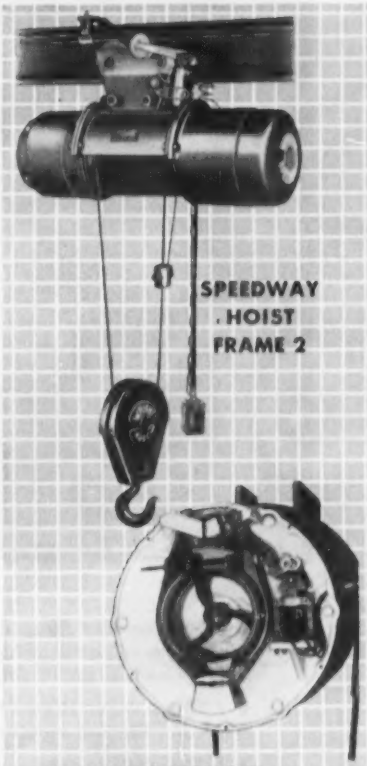
B-669 END TRUCKS

ACCO products

WRIGHT Electric Hoists for Top Production, Easiest Maintenance

WRIGHT *Speedway* Electric Hoists—Frame 1, Frame 2 and Frame 3—are ideal **HOISTS** for handling production materials where the load requirements **ARE** from ¼ ton to 10 ton capacity. Their design includes many advanced **SAFE** operating features. Sound choice of components provides them with **EFFICIENT** balance for smooth running. Parts are designed and built to give **RUGGED** performance with a minimum of care. Plant operating men find them **ADAPTABLE** to almost every type of shop work because of the wide range of speeds, lifts and mountings.

The more particular you are in your selection of hoisting equipment—
the more likely you are to choose WRIGHT
Write our York, Pa., office for Booklet DH-133B
for more complete information on WRIGHT Electric Hoists
Circle No. 33 on Reader Service Card for more information



SPEEDWAY HOIST FRAME 2

BRAKE & SOLENOID OF FRAME 2 HOIST

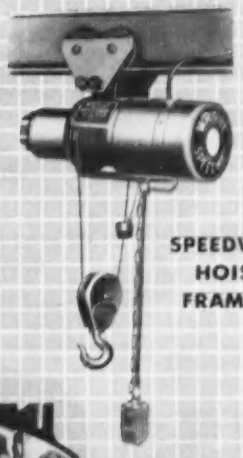
Visit the WRIGHT Booth

No. 1758, at Materials Handling Show

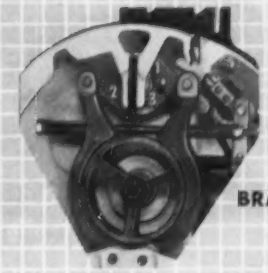
INTERNATIONAL AMPHITHEATRE, CHICAGO

MAY 16-20

for Better Value



SPEEDWAY HOIST FRAME 1



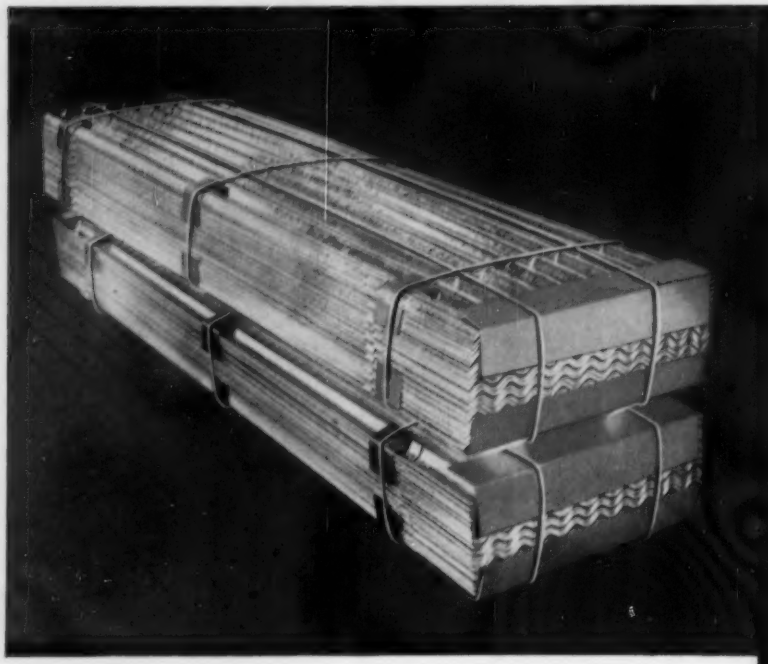
BRAKE ADJUSTMENT FRAME 1

WRIGHT

Electric Roller Chain Hoist

- Fewest number of wearing parts
- Self-locking, double-worm gear acts as own load brake
- Spring-set, shoe-type motor brake, clam shell type
- Oversize precision ball bearings
- Forged steel-alloy hook, swings and swivels

USS Gerrard ties ANYTHING you've ever seen



Units of corrugated steel sheets to Fibreboard cartons of nuts

- USS GERRARD Strapping, Round or Flat, is available in a wide range of sizes—tailored for every tying application from small parcels to palletizing, unitizing, crating, and carloading.
- USS GERRARD Round Strapping costs about *40% less* than any other form of metal reinforcement.
- USS GERRARD hand-operated and semi-automatic machines tie quickly, efficiently.
- USS GERRARD-strapped bundles and pallets can be handled with greater safety in less time. Accidents averted, man-hours saved.
- Steel-strapped bundles require only one inventory. No loose pieces. Pilferage eliminated . . . damage prevented.
- Single-source buying of both Round and Flat Steel Strapping reduces freight charges and paper work.

Bring your packaging and tying problems to USS GERRARD. *Our engineers will help you solve them—at no cost to you.*

SEND FOR THIS NEW FREE BOOKLET NOW

GERRARD STEEL STRAPPING DIVISION, UNITED STATES STEEL CORPORATION
General Offices: Chicago, Illinois

SEE The United States Steel Hour. It's a full-hour TV program presented every other week by United States Steel. Consult your local newspaper for time and station.

Gerrard Steel Strapping
2937 West 47th St., Chicago 32, Ill.

Please send me, free of charge, the new 36-page GERRARD Blue Book of Packaging.

Name.....

Company.....

Address.....

City.....

State.....

USS GERRARD STEEL STRAPPING

Round and Flat

UNITED STATES STEEL

Circle No. 139 on Reader Service Card for more information

PACKAGING AND SHIPPING SECTION

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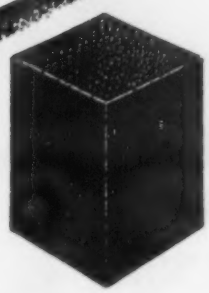

An Easy Index to This Month's Advertisers

Are you looking for a particular type of packaging and shipping equipment? Listed below are advertisers according to type of product they are advertising in this issue. We have attempted to make your job a little easier by listing them as often as possible. To use this index, find the type of product in which you are interested . . . turn to the advertisers listed under that product . . . circle the correct numbers on the reader service card, mail it, and you'll get complete information in a jiffy.

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COLORS that roll on dry!

LANE MARKING COLORS that have revolutionized lane marking methods! "SCOTCH" Brand Plastic Tape No. 471 gives you eight bright colors that are simply *rolled* onto the floor . . . are perfectly dry and ready for traffic when applied. Fast and easy . . . yet so *money-saving permanent!* Tape sticks at a touch to any clean, dry surface; lasts up to 2 years; is unaffected by acids, greases, salts, or most common commercial solvents. Tape colors can easily be cleaned with gasoline or most commercial solvents. Ask your Tape Distributor for complete information, or write us for folder described below.

PLASTIC TAPE

. . . one of more than

300 Pressure-Sensitive Tapes

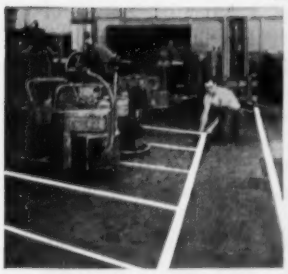
for industry trademarked . . .

REG. U. S. PAT. OFF.

SCOTCH

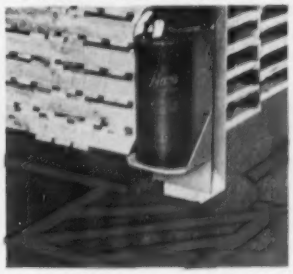
BRAND

Look what you can do with it!



EVEN HEAVY materials-handling equipment won't "break down" "SCOTCH" Brand Tape No. 471. Use it for marking parking and storage areas on concrete, wood, painted or composition surfaces.

ORGANIZE production flow areas; designate aisles; "code" work areas with "SCOTCH" Brand Plastic Tape No. 471. Eight colors for "color key" systems. Easy-to-apply tape sticks at a touch!



IDENTIFY fire stations, emergency equipment locations. Mark danger areas, obstacles, low clearance passages. Special markings are easy to create; are ready for traffic without drying time!

FREE folder describes "SCOTCH" Brand Plastic Tapes for Lane Marking in detail. Just write on your letterhead: Minnesota Mining and Mfg. Co., St. Paul 6, Minn., Dept. FL-55.

The term "SCOTCH" is a registered trademark of Minnesota Mining and Manufacturing Co., St. Paul 6, Minn.
Export Sales Office: 99 Park Ave., New York 16, N.Y. In Canada: P.O. Box 757, London, Ontario.

Circle No. 210 on Reader Service Card for more information

A tour through the packaging room of the future . . . with a top-notch design engineer as the guide. Handling to and from the U-shaped lines in this packaging room is entirely automatic and under the control of an airport-type control tower. Products and packaging materials move on enclosed conveyors.

Packaging Room.....1965

by R. T. Howe, vice president

Processes Research, Inc.

"Come with me on an imaginary tour of a packaging room of the year 1965 . . ."

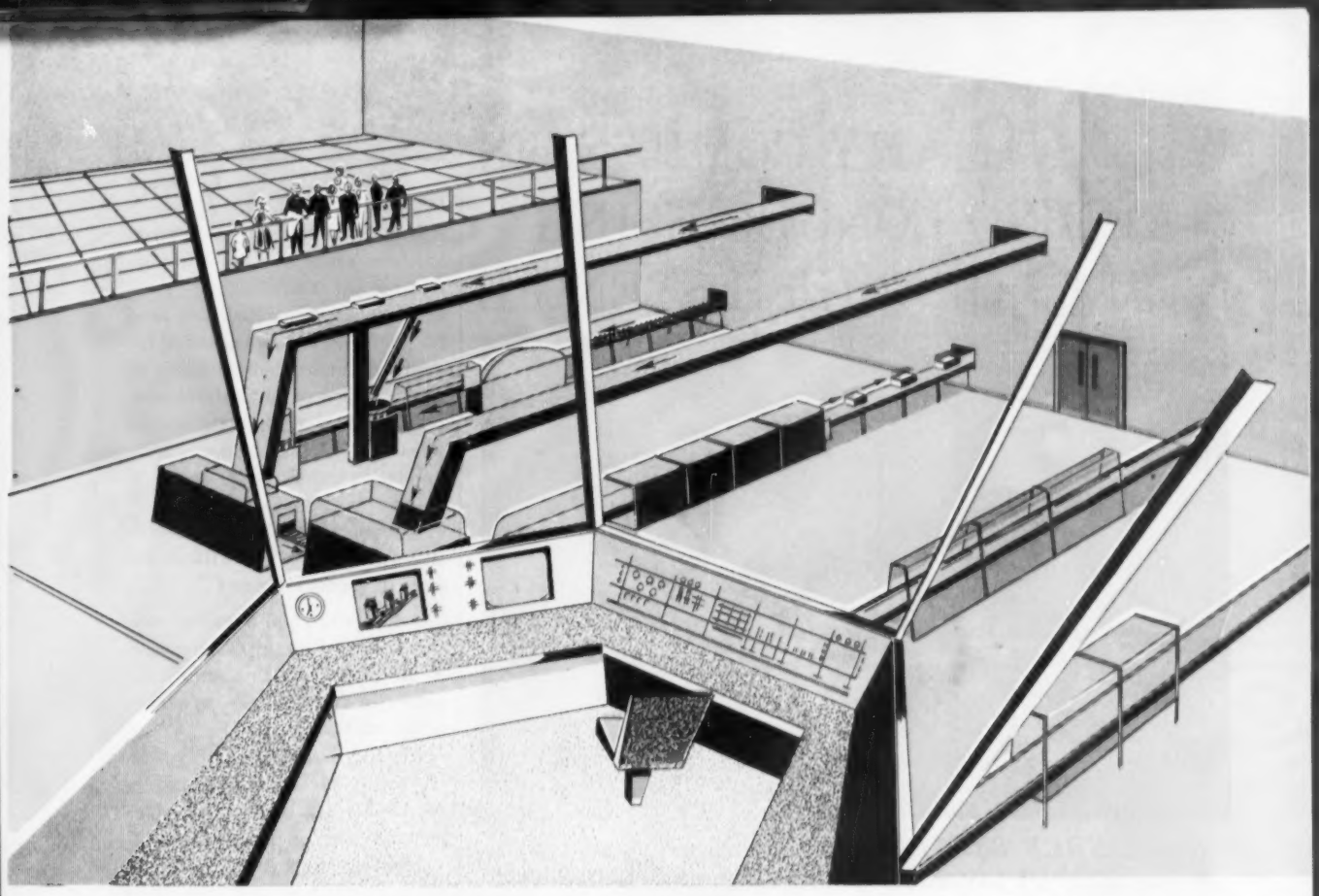
Back in 1955, a trend was started toward completely integrated packaging operations. "Today", in 1965, that trend has grown into normal reality. The packaging room which we will visit exemplifies the best in integration. There is a close interlocking between packaging and receiving, warehousing, order picking and shipping functions. A high degree of mechanization in those activities has permitted the over-all scheduling of production and order filling to proceed with smoothness and efficiency never before possible.

Ingredient and packaging materials are held in carefully classified storage areas and are automatically dispensed into the packaging room on remote-controlled enclosed conveyors. Finished products from several packaging lines proceed on simple, mechanical conveyors to warehouse areas, classified by type of product. Automatic racking, palletizing or stacking of finished product has eliminated the confusion and the time-wasting handling of many packaged-goods warehouses of the past.

Individual order picking from classified finished goods storage is an automatic operation. It has been integrated with an automated paper work system of order preparation so that the entire over-all receiving-storing-manufacturing-packaging-order picking-shipping cycle is able to function with the greatest efficiency to meet production schedules. But, let us get back to the packaging room itself. . .

A foot bridge connects the visitor's balcony, on which we have been standing, with a centrally located airport-type glassed-in tower. Control of all operations is from this room. Almost unlimited visibility through the gigantic windows permits a supervisor to keep the entire packaging department under a watchful eye. For close study of minute details of important line functions, television screens show views transmitted by strategically located cameras.

Operating controls, warning signals, inspection records and production quantity counts are all mechan-



ically transmitted from the operating floor to this control room.

"The packaging room of 1965 simulates a high speed automobile assembly line . . ."

Materials and products arrive on schedule, in necessary quantities, via mechanical conveyor systems. Primary containers, tops and caps, cartons, inserts, bundling papers, glues, shipping containers, tapes, staples and any other needed supplies move to proper points of use in orderly fashion. The products arrive from other sources in apparent complete disregard for speeds and quantities of supplies. Yet, there are no jam-ups and no idle packaging lines.

One of the secrets of the high degree of coordination found in this packaging room is found in the automatic feeding hoppers or magazines on individual machines. On each feeder is a low-level electric control device which actuates proper conveyors, in correct sequences, to deliver supplies from storage, as required.

We note that a number of the packaging machines are large combination units which perform a number of different packaging operations. Even in 1965, this is just a start of a new trend and by no means standard procedure in packaging operations. As machinery manufacturers continue to break away from specialization however, more and more multi-operation machines will be built until, some-day, single machines which do complete packaging jobs from unscrambling through case sealing will be a reality.

The single-purpose machines which are used in our 1965 packaging room have been closely coupled. Common drives have been used between machines in most cases. Containers are held under positive mechanical control during transfer between machines and during operations within individual machines.

"Package inspection, 1965 style, is suited to the higher speeds of operations."

Visual inspection has been replaced by mechanical inspection. Now, the following inspection functions are all accomplished by automatic mechanical means:

1. Chipped or damaged containers are detected and ejected.
2. Container and contents are inspected for clarity and foreign objects.
3. Labels are checked for register and correctness.
4. Over-and-under fill detection is accomplished by automatic correction.
5. Closure inspections include cap liner checks, tightness checks, cross-thread detection and, of course, the detection of missing caps. (Where caps are missing another one is applied.)

(More on next page)

WHY SO MANY COMPANIES ARE NO LONGER USING LABELS OR BRUSH-STENCIL

New WEBER SYSTEM for addressing shipping containers does job faster, more accurately, at much less cost

Pictured above is a system that is now accepted as the most efficient method of addressing or marking containers. Time and cost studies taken by present users prove its superiority in speed and economy over less modern methods. It's the Weber Direct-To-Container System.

The cartons have been pre-printed with a label frame by the carton manufacturer. The ship-to address is printed inside the frames at the rate of 40 to 50 cartons per minute with a Weber RJ-1 Hand Printer. (Carrier associations enthusiastically approve the sharp, waterproof, fade-proof print).

The RJ-1 prints from an inexpensive stencil that can be typed individually or with bill-of-lading or invoice forms as described below. It has a reservoir that holds enough ink for 7,500 to 10,000 prints. Can be supplied with one or two counters for count control.

Find out more about this efficient system for addressing and marking your shipping containers. Send for the folder offered in the coupon.

another

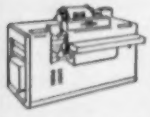
Weber

system

Weber Label and Marking Systems
Div.—Weber Addressing Machine Co.
Mount Prospect, Illinois

SHIPPING PAPERWORK SIMPLIFIED

Typist sticks Tab-On Stencil to form over the "Ship To" area. In one typing, form and stencil are prepared with ship-to address. Stencil then goes to shipping.



Continuous-form, marginal punched stencils are also available. Can be cut on automatic tabulating equipment, electric or manual typewriters.

MAIL THIS COUPON *for more information on the Weber Direct-To-Container System*

COMPANY_____

INDIVIDUAL_____ TITLE_____

ADDRESS_____

CITY_____ ZONE____ STATE_____

WEBER LABEL AND MARKING SYSTEMS • Dept. I-E • Mt. Prospect, Illinois

Circle No. 291 on Reader Service Card for more information

PACKAGING ROOM 1965

Continued

Labeling in this packaging room has been vastly improved through the use of thermosetting glues which have eliminated the need for gum pots, transfer rolls and the required cumbersome cleaning of glue handling parts on shutdowns. Labeling is a continuous motion process and triplex and quadruplex station machines are used.

Some of the general building features with which we are impressed are:

Temperature and humidity control—dictated by product requirements and, to some extent, by the nature of the packaging materials being used.

Filtered and sterilized air supply to the packaging room—This too has been dictated by the product and packaging materials.

Lighting designed for specific requirements—The absence of shadows is one reason why the packaging room of 1965 is virtually accident-free. Because lighting was planned-for in the design phases of the building and the material movement systems, proper lighting is supplied for all critical operations. Personnel can spot trouble quickly and easily.

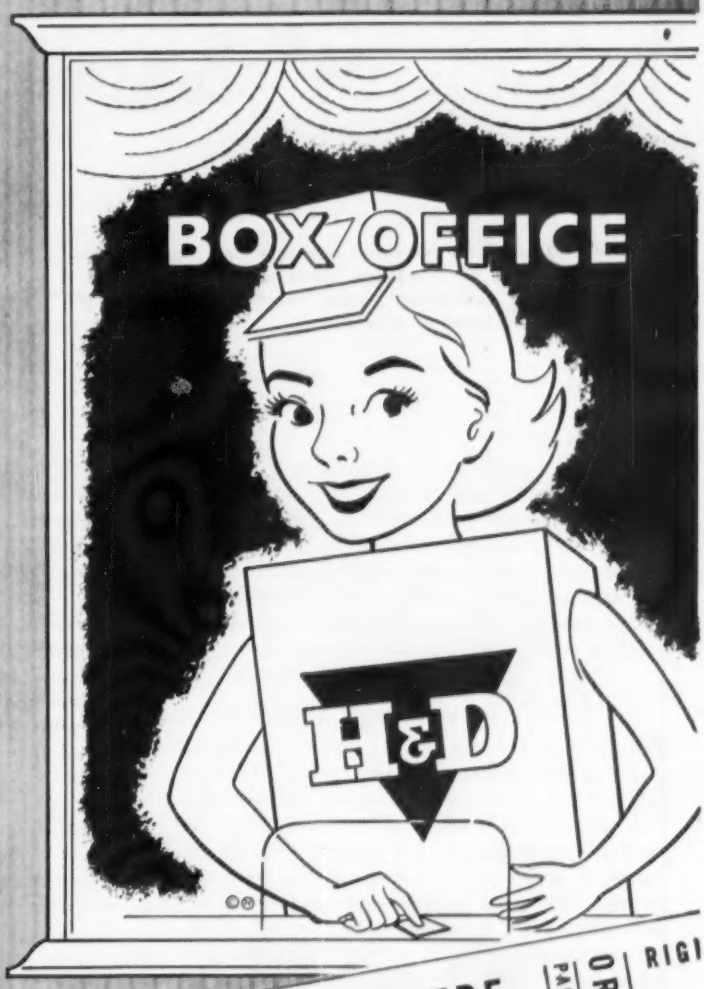
Noise and vibration control—As a result of proper insulation materials, the packaging department is a better place to work. Worker fatigue, which precedes accidents or inefficient operations has been defeated.

Floors constructed to suit individual requirements—Asphalt tile has been used as the general purpose flooring material because of its high resistance to wear and easy-cleaning features. Parquet maple floors have been used in a "show-place" drug packaging type area which is subject to frequent visiting tours such as ours. In another area where acid resisting floors were necessary, quarry tile or ceramic tile provides the desired quality and durability.

Meet

CoraGated ...

the packaging industry's number one "box" office attraction



PACKAGING THEATRE

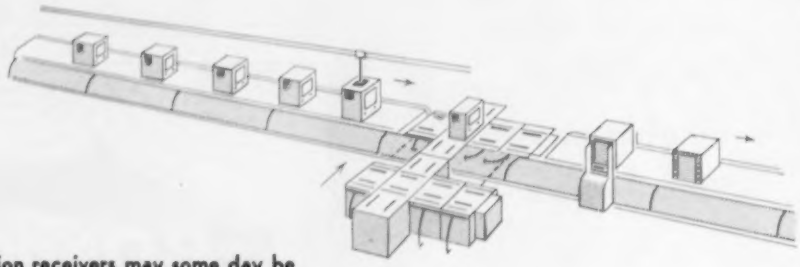
1 HINDE & DAUCH
AUTHORITY ON PACKAGING
SANDUSKY, OHIO

ORCHESTRA
PACKAGING THEATRE

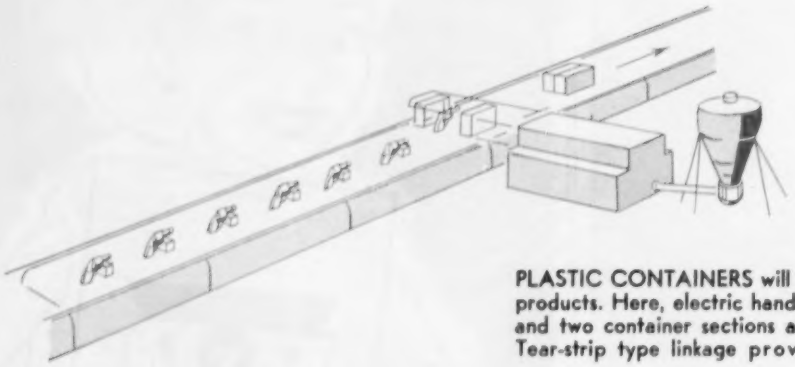
RIGI

Circle No. 158 on Reader Service Card for more information

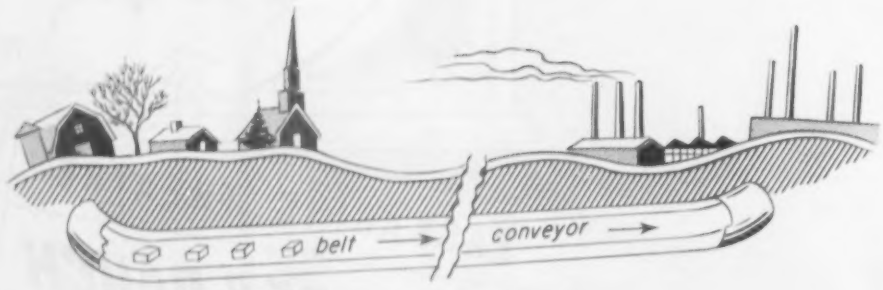
Containers made of magnetic-content material for electro-magnet handling . . . shipping cases which are mechanically constructed around a unit as it moves along a conveyor line . . . plastic containers which can be speed-molded around products. These types of developments will one day give us . . .



PACKAGES for television receivers may some day be constructed of two-piece containers with pre-glued, laminated cushioning blocks. Mechanical positioning arms fold container around unit.



PLASTIC CONTAINERS will be speed-molded around products. Here, electric hand drills move into position and two container sections are pressed around them. Tear-strip type linkage provides for easy opening.



TO TRANSPORT PACKAGES from urban centers to hearts of distribution points in cities, underground networks of conveyors will be used. This method will always enjoy a "fair climate", untroubled by storms, traffic conjestion, etc.

...PACKAGES *Geared to Continuous Production*

by K. H. Lillis
Container Laboratories, Inc.

FORTHCOMING developments in super cities, super industries, and super transportation methods will require closely allied improvements in packaging and shipping containers. New materials and new designs will have to be created to forge the way toward quicker and less expensive methods of operation.

Palletized handling methods, although not outmoded in the packaging and shipping departments, will one day be greatly augmented by electro-magnetic lifting equipment operated by overhead mono-rail installations. Containers, fabricated from a magnetic-content material, will be lifted in substantial quantities by the electro-magnet and deposited in orderly tiers in vehicles or on production lines.

Linked with the future packaging refinements of the "automation period" will be a phase of container development geared for packing larger equipment items, such as television receivers, with the same degree of mechanical aptitude and genius that has been woven into our present day machine packaging of such small items as tooth paste, candy, etc. For example, we anticipate packaging lines which may be something like this:

Completed television sets will move along a conveyor line toward the packaging operation. They will be automatically transfered to the packaging machine by an overhead monorail and hoist arrangement. A pre-stacked hopper-fed arrrangement of unassembled two-piece containers will be located in such a manner as to position the top box on a level with the conveyor surface. The television set will pass into place and be located automatically in an upright position on the bottom panel of the container. Pre-glued laminated blocks are located in the various spots on the box sheet to provide the required cushioning.

The packaging operation is completed as mechanical positioning arms fold the container into place around the set and a final metal stitching operation effects a quick, strong seal of the vertical corners.

Such mechanized procedures will come into existence with a multitude of "standard run" items and may well be perfected to so promising a degree, that even various size ranges of consumer material will be accommodated with a minimum of machine changes.

Plastic Shipping Containers

Equipment will one day be perfected to speed-mold plastic containers in various sections adaptable for rapid production line packaging. This is previewed in pictorial form in a sketch which accompanies this article. Plastic container sections pass from the press to positioned stations on the conveyor line. Segments of synthetic cushioning material have been inserted in cavities molded into the container walls. As the item to be packaged arrives in the proper position, the container sections are pressed together so as to encompass the product. The interior cushioning pieces conform to the shape of the product and lock it safely in place.

The butting plastic sections will be secured with a tear strip type of linkage providing for an easy opening feature at the ultimate destination. Plastic incorporated in this type of container will be on an unbreakable nature and it will be standard practice for packaging and shipping departments to possess equipment for melting down used containers. The molten plastic will be remolded into new container designs and continue its almost endless life.

A realistic approach to packaging of tomorrow re-

(Continued on page 206)

Production-Line Methods *for Shipping*

The plant of the future will require high-speed, smooth moving distribution methods. Moves across the street . . . or across the continent . . . must be coordinated with handling in the shipper's plant and in the consignee's plant.

Air Freight . . .

There is no better way to reduce that portion of the total distribution bill represented by transportation than by adherence to this simple slogan: "*better use of better transportation*".

To achieve that aim will require intense cooperation between shipper and carrier, for transportation is simply a tool of industry, and better tools are the result of better understanding of the job to be done. Better use is the result of greater knowledge of the tool's capacity to do the job.

It is claimed that within the next decade, we will see air freight, as a tool for use by industry, become increasingly important in at least two ways: (a) in "break bulk" distribution operations; (b) in reducing warehousing loads.

"Break Bulk" Operations

To illustrate the use of air freight in break bulk operations, consider the mass distribution of a product in a relatively concentrated area—like a new brand of cigarettes to be introduced in a test. The bulk shipment can arrive in the test area by air and be broken into small packages at the terminal, to be distributed by mail in the local zone. This permits accurately controlled mailing, anywhere in the country, at relatively low cost.

The same could apply to seasonal merchandise, where a large number of retailers are to receive relatively small shipments of a product. The manufacturer will be able to send total requirements for a given marketing area by air freight, and the shipment can be broken for local distribution.

This type of distribution has distinct advantages for the retailers because it permits cutting down the length of lead-time that they will need for placing orders. Furthermore, it will make it possible for them to calculate their needs more precisely.

Reducing Warehousing Needs

Manufacturing has its heart in the assembly line, in one form or another. Materials, parts and subassemblies are brought together at one end or along the sides of a line. The finished, assembled product emerges at the other end.

In the past, to maintain that flow without interruption, industry has relied upon backlogs of materials, parts and sub-assemblies at the starting end of the line. These components have been shipped to the user in large quantities. The backlog represents a large investment in itself . . . It must be stored—and that costs money . . . It must be handled into and out of storage—and that costs money . . . A bad guess on the market may bring obsolescence to the components in the production stockpile—and that too costs money.

A reasonable conclusion, then, is: the smaller the stockpile, the greater the economy. Transportation methods of the future will probably be aimed at permitting smaller stockpiles while keeping assembly lines fed at constant rates.

How it all works out in balance—whether such a saving in stockpile costs will be offset by greater

costs in procurement—is a question which each manufacturer must answer for himself.

Carload and truckload services are expected to remain the principal transportation factors in this kind of production-control process, but air freight may well be the key to its success. Whenever the normal flow is interrupted, by work stoppage or lag at the supplier's plant—or just by some minor mishap on the rails or highway—there must be a way immediately to make up hours or days of delay and to sustain the continued operation of the assembly line. Here is where air freight will come into the picture.

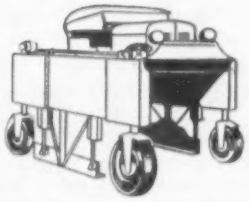
Air freight can be expected to be an increasingly important factor in the distribution of slow-moving parts and materials to distant warehouses. Because any point in the country can be reached in a matter of hours by air, slow movers can be stocked at one or only a few centrally located warehouses. Orders can be filled with the promptness now reserved for more popular items.

The cost of such distribution over a given period might well be far less than that of constructing a building to house the slow-movers, keep inventory records on them, etc. for one marketing area.

The answer to the question, "to what degree will air freight become a factor of importance to American business?", will be written over the next 10 to 20 years. The air freight tonnage of future years will be determined by the degree to which industry, eager for speed, is willing to buy for its value, and by the rapidity and zeal with which the air carriers are willing and able to expand their capacity for speed with dependability. If air freight accommodates only one percent of the nation's traffic burden, it will be, not two or three times, but thirty times as large and useful as it is today.

(More on next page)

The Straddle Truck as a Shipping Vehicle



by H. N. Dimick, supervising engineer
Straddle Truck Division, Hyster Co.

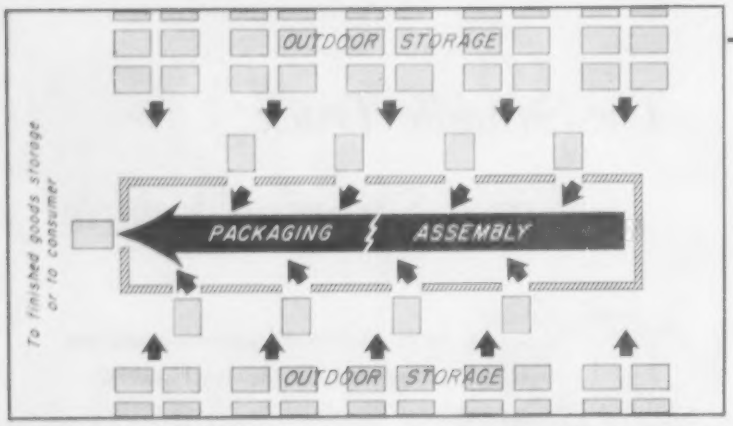
The straddle truck picture today is no more than a print from an under-exposed negative that fails to outline, except to a few prescient observers, a clear-cut picture of the future. Let's set the date at, say, 1965 . . . ten years hence . . .

Visualize a huge central warehouse that serves some fifty supermarkets throughout a metropolitan area and within a radius of twenty miles. Transportation equipment for delivering goods from warehouse to markets consists of ten straddle trucks and twenty-five van boxes. The boxes are 24′ long, 60″ high, 50″ wide and equipped for handling with standard straddle truck load shoes. End gate of the van boxes are hinged for lowering and provide access ramps for small fork lift trucks for loading. Market managers phone in orders for goods according to requirements, and loading is continuous at the supply center. Straddle trucks pick up the loaded boxes, deliver them to stores for which they are ear-marked, pick up the emptied boxes and return them for reloading. Within seconds after arrival at either end of the run the trucks are on the way again and are paying dividends on the investment in rolling equipment and operator's salary. This represents but one type of business. There are hundreds of others that may be organized in the same or like manner.

The time is not far off when packaging for straddle trucks and designing buildings for their accommodation will become a prime factor in the fast-moving industrial world.

As an important factor in future automation, we shall see single units and caravans of straddle-type or over-the-load vehicles on streets and highways, some of them pulling straddle-type trailers with hoisting mechanisms powered from the towing unit. The trailers will be detachable for spotting at any point along the route for distribution of the goods. Trailers will be picked up by the straddle truck on the return trip. In many cases both truck and trailer will be loaded with goods for a return trip pay load. They will be handling a variety of materials ranging from crated farm and garden products to huge tanks of fuel oil and other liquids—perhaps someday, but we hope not, guided missiles on their way to launching ramps.

Or, don't be too surprised if someday we see six and eight-wheel tandem straddle trucks with a wheelbase of 200 to 250 inches carrying suspended loads of fifty tons and rolling along with the everyday traffic.



OUTDOOR WAREHOUSING is seen as one cost-cutting benefit of demountable cargo holders. Materials and component parts move from outdoor storage area directly to machine on production line. Completed products may be put in cargo holders for shipment or outdoor storage.

Rail and Truck . . . . .

ANY discussion of railroading and trucking and their places in the future of transportation, must almost automatically devote considerable attention to the hotly controversial "piggy-back" question.

Most railroad men will tell you that piggy-backing (transportation of trailers on flat cars) is here to stay. They acclaim the method for cost reductions and accelerated service it has produced. The low-claim factor effected by piggy-backing is used as a clincher.

There are others, however, who are far from sold on the idea. Some railroaders and many truckers insist that piggy-backing has no place in the future and that, what's more, it is already obsolete. They envision, in its place, distribution methods which will utilize: (1) demountable cargo holders which will be usable interchangeably on all types of vehicles; (2) convertible trailers which have pneumatic tires for over-the-road movement, and an extra set of metal flanged wheels for rail transportation.

New Piggy-Back Development

Proponents of piggy-backing base their optimism on developments like a "car of the future for transporting trailers", which is now in experimental use on the New York, New Haven and Hartford Railroad. The 75-foot, light weight car is designed specifically for piggy-back. When put into full use, it is expected to speed loading and to cut equipment and operating costs in half.

The car consists of two steel I-beams, 75 feet long, placed side-by-side to form the main body. Outer edges are 39 inches apart to conform to standard inside wheel width of trailers. At each end of the car, diagonally opposed on each I-beam outer terminus, there is an adjustable rail.

When the car is in transit, the rail rides locked in vertical position. For loading and unloading operations, it is lowered into coupling position by means of a hand-crank located at ground position. When both coupling rails are lowered they form a bridging rail from car to car. Thus, a trailer equipped with flanged wheels inside its regular wheel assembly is easily end-loaded over an entire string of cars.

To suit terminal yards, for piggy-backing with the new car, little modification will be required. Instead of depressed tracks or built-up platforms, the ordinary team-track will be used. By comparison with present expensive piggy-back facilities used in end-car handling, the new car requires only a rail ramp and spring-operated centering device. It is claimed that the new car permits handling trailers on or off with greater speed than any other method or plan yet devised.

Demountable Units . . .

"Why go to the expense of transporting complete trailers with their expensive undercarriages?" is the

Demountable cargoholders may be designed for transporting

REFRIGERATED UNIT for fruit, produce, other perishables.

OPEN-TOP BOX for scrap metal, gravel, coal, sand, etc.

TANK for liquids, like oil, milk, industrial chemicals.

question most commonly posed by those who believe that piggy-backing is doomed. "Why not make use of some type of demountable cargo holders which can be transported on any kind of vehicle, including flat cars, flat-bed trucks, delivery trucks, ships and airplanes? . . . cargo holders which might take the form of closed boxes, bins, tanks or flats, and which could be handled on and off carriers by means of fork or straddle trucks."

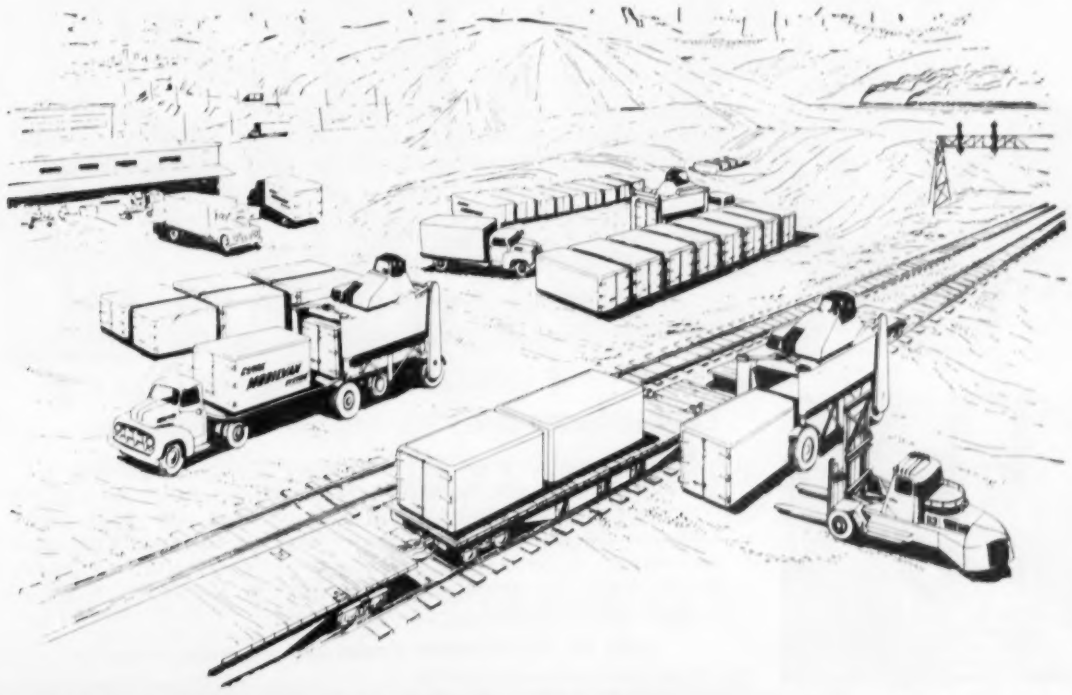
The forecast calls for a manufacturer to load his product into demountable cargo holders at his plant. If he has a rail siding, he will put the loaded cargo holders directly onto flat cars. If he has no siding, he will use flat-bed trucks for delivery to the railroad depot, or to the final destination. Unloading is rapid and vehicles are detained for only short "turnaround" periods.

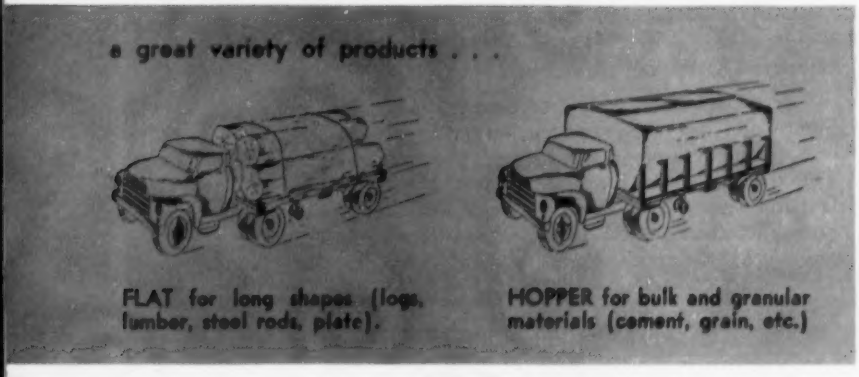
Here are some possibilities seen by proponents of the demountable cargo holders:

1. *Passenger freight combinations on railroads . . .*

Today, passengers can be unloaded and loaded and a train can be on its way again in a matter of minutes. Freight, on the other hand, usually holds up cars for many hours for unloading and loading. Yet, freight operations are almost always the more profit-

(Continued on page 208)




a great variety of products . . .
FLAT for long shapes (logs, lumber, steel rods, plate).
HOPPER for bulk and granular materials (cement, grain, etc.)

DEMOUNTABLE CARGO HOLDERS may provide the answer to piggy-back controversy. Units may be hauled interchangeably on rail cars, flat-bed over-the-road trailers, or delivery trucks. Use will probably be extended to ocean-going and Great Lakes vessels and eventually even to aircraft.

WHAT'S NEW... in Packaging and Shipping Equipment

Portable Wire Stitcher

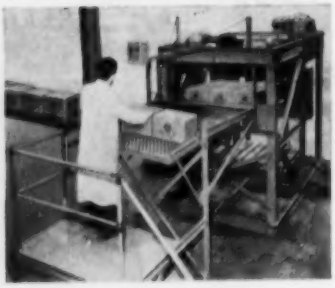
A portable arm-type stitcher, developed by Acme Steel Co., is said to increase flexibility of such operations as closing bags of many types and materials, attaching them to cards, assembling light chipboard boxes, or fastening labels to merchandise. It occupies only a trifle more than a square foot of bench space, forms wire stitches and clinches them at 200 per minute. Control is by foot switch or work-actuated trip. Weight is 59 pounds.

Circle No. 310 on Reader Service Card for more information

Piggy-Back Tie Down

Designed and built by American Forge and Manufacturing Co., in conjunction with one of the largest railroads, this tie down incorporates a new Fabreeka type snubber to absorb shock and thrust. It employs a heavy duty ratchet type railroad binder to position, tighten and hold trailers on flat cars. Single trailer flat cars use eight and double cars use 16 of the tie downs. The large hook at right attaches to car side rail (or bar).

Circle No. 311 on Reader Service Card for more information



Low-Cost Pallet Loader

With the Palletizer, a pallet-loading machine manufactured by J. W. Greer Co., the economies of mechanical pallet loading are reportedly brought within reach of both large and small plants. One man can palletize up to three or more times as many packages and cartons as by manual methods alone. The machine is readily installed with no special building or floor construction. Simplified design is said to reduce maintenance costs.

Circle No. 312 on Reader Service Card for more information

Improved Strapping Stretcher

The model 48 stretcher of Gerrard Steel Strapping Div., U. S. Steel Corp., was designed to eliminate features heretofore found to be time consuming and fatiguing in manually operated equipment. The stretcher, which accommodates 2" x .050 flat steel strapping. features: ease of carrying; ease of threading; easy removal from strap after completion of tie; extension handle for added leverage; tension handle repositioning feature; long life.

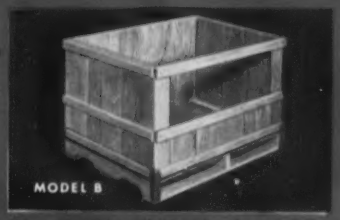
Circle No. 313 on Reader Service Card for more information

(Continued on page 201)

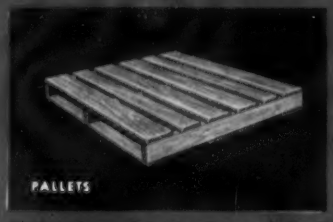
B-G TIGHT-CORNER HINGE AVE

PACKING TIME
STORAGE SPACE
INSURES
SAFE DELIVERY

Pallet Box is easily attached to any standard pallet by means of 4 corner irons and flat or round steel straps. Collapsible for storage and return shipment. We supply corner irons.



This collapsible pallet box has front opening for easy access to contents when stacked or in racks. Furnished with or without self-locking insert panel.



Hardwood or softwood pallets made in all sizes and styles. Nailed with cement-coated nails or screws.

B-G expendable pallet box, designed to withstand specific loads. Inexpensive, permitting discard after usage. Top cover, if desired.

B-G Collapsible, hinged pallet box with drop-leaf panel for greater accessibility. All B-G pallet boxes can be furnished with top cover, if desired.

BIGELOW-GARVEY'S

EXCLUSIVE TIGHT CORNER HINGE

stands up under scientific laboratory testing!

● B-G CRATES and PALLET BOXES assure you the utmost in STRENGTH and SAFETY in the shipping and storage of your products.

● B-G Containers are SCIENTIFICALLY ENGINEERED and TESTED in our new, modern laboratory, APPROVED by the NATIONAL SAFE TRANSIT COMMITTEE.

● B-G Unique TIGHT CORNER feature makes possible a sturdy, collapsible hinged container assuring GREATEST ECONOMY in your shipping, handling and storage problems.

● B-G Tight Corner Containers are INDIVIDUALLY ENGINEERED to fit your product.

● B-G invites your inquiries for further information. Sales engineer will call upon request.

● B-G offers without obligation the benefits of 30 YEARS EXPERIENCE in DEVELOPING BETTER, STRONGER and more EFFICIENT Shipping and Storage CONTAINERS.

The collapsible crate with the exclusive B-G Tight-Corner Hinge. Offers unusual rigidity and strength, yet light in weight. Easily assembled. Nail holes pre-drilled. Made up in 3 parts. Shipped collapsed.

Corrugated or fibre board, reinforced with wood cleats. Strong and rigid, gives full coverage. Assembles quickly.

MILLS: ARKANSAS GEORGIA WISCONSIN MINNESOTA ILLINOIS

always check B G General

Write for complete details and prices to...

BIGELOW-GARVEY lumber company

Office and Laboratory 326 W. HURON STREET • CHICAGO 10, ILLINOIS

Phone WHitehall 4-5252

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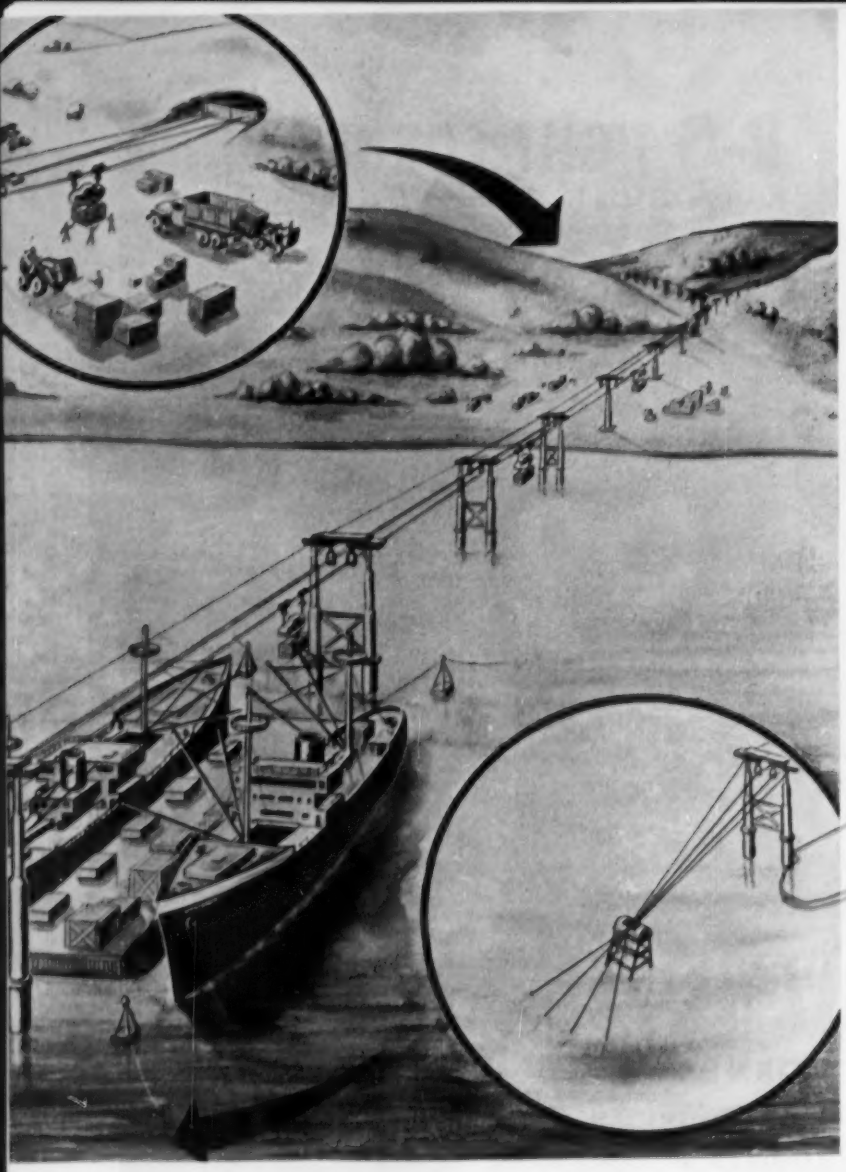
BY 1965 . . . ECONOMICAL

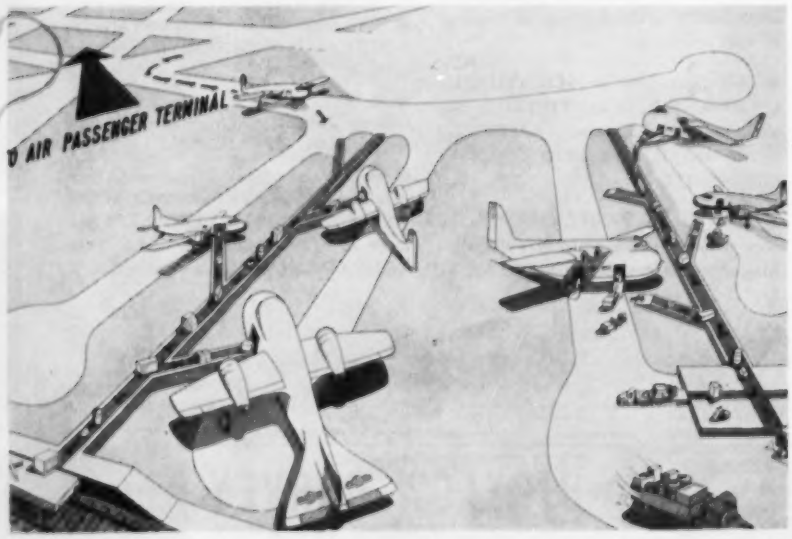


AUTOMATION

NEW EQUIPMENT and procedures are being developed by the Transportation Corps to insure rapid movement of Army units, weapons, ammunition and other supplies. Aerial tramway systems will permit small ports to handle great quantities of material.

UNITIZATION

AIR TRANSPORTATION will play an increasingly important part in movements of personnel and supplies. Air terminals will be designed to facilitate the transfer of cargo in and out of aircraft and to and from other transportation media.



SOLUTIONS TO . . .

The Military Distribution Puzzle

PROJECTING ideas into the future is like working a jig-saw puzzle. You hold the pieces, but you must juggle them around before they finally are in their proper places and convey a meaning.

For composing a picture of military material handling ten years hence we have in hand several "pieces" such as *mobility, unitization, transportability, automation, dispersion, roll-on roll-off* and *flexibility*.

The job for the next few years will be one of fitting these pieces together. It requires putting them to work, individually and in unison, with the objective of enabling us to provide transportation and material handling services under 1965 conditions.

The identification and selection of these factors are based on two primary considerations. One is military requirements; the other is a new concept of transportation efficiency made possible by advancements in the field of technology and management.

The Transportation Corps' military requirements are determined by the needs of the Army combat forces. Our mission is to support these forces and our methods and equipment must be geared to the conduct of warfare of tomorrow.

Nuclear weapons have forced changes in battlefield tactics and long range strategy. To minimize the effectiveness of mass destruction weapons and at the same time retain striking force, our Army is adopting new concepts of dispersion and mobility.

Through dispersion over a large geographic area, military units will be able to escape destruction from atomic or hydrogen agents. Through organizing its forces into smaller, self-sufficient and highly mobile battle groups, the Army will possess offensive power without presenting remunerative targets for large scale weapons.

The Transportation Corps, alongside the other Technical Services of the Army, has been reorienting its operations to meet the logistic requirements of these new concepts of warfare. It too is concerned with dispersion and mobility, in addition to such factors as transportability, automation and flexibility.

In order to move Army units, weapons, ammunition, fuel and other supplies in future conflicts we are developing new equipment and procedures as well as making the necessary adjustments on what we have and to what we have been accustomed. This will take time, but I hope that within the next ten years most of what I am describing here will become reality.

Under conditions as we can foresee today, military personnel and supply movements will have to be made

(More on next page)

Major General Paul E. Yount graduated from the U.S. Military Academy in 1930. He holds a Civil Engineering degree from Cornell University, is a graduate of the Army's Engineer School, and has had special industrial training in railway operations. During World War II, he served as Chief Engineer, U.S. Military Iranian Mission and later commanded a base section, Service Supply, China-Burma-India theater. During the Korean conflict he was Deputy Commander, Japan Logistical Command and later Commanding General, Second Logistical Command in Korea. He was appointed Chief of Transportation in 1954.

THE MILITARY DISTRIBUTION PUZZLE

Continued

by air on an ever increasing scale. Personnel movements will not create many problems. Soldiers walk on and walk off planes, but materiel does not.

Military transportation units, whether they be Army, Navy or Air Force, must be prepared to load and unload large quantities of supplies on thousands of planes. Material handling must be accomplished rapidly so that the planes do not remain on the ground for long periods. Accordingly, air terminals must be designed to facilitate the transfer of cargo in and out of aircraft and to and from surface transportation media.

The Transportation Corps has had considerable experience in loading and unloading aircraft. As a result of the knowledge gained by operating all terminal service during the Berlin Airlift, we can visualize the nature of future equipment requirements and operating methods. Unless material handling on the ground keeps abreast with aircraft developments, increases in plane carrying capacity and in flight speed will become meaningless.

The Air Force is looking forward to flying large transport craft with payloads up to 50 tons. Loading and unloading these giants will require automation of material handling equipment. Airports will occupy larger areas. Cargo terminal sites will be adjacent to, but divorced from, landing field operations. Terminals will consist of several subdivisions separated by long ramps. On landing, planes will taxi from runways to these ramps and park alongside for unloading. For departing flights the procedure will be reversed. Forklifts and apron conveyor belts will move cargo in and out of the craft. Master conveyor belts installed on the ramps will move cargo between rail and truck heads and aircraft loading points.

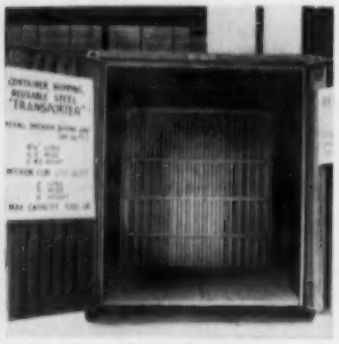
Handling the largest cargo planes, utilized mainly for heavy wheeled equipment such as trucks and construction machinery, will require little equipment as the cargo will be rolled up into the plane and rolled down from it on aircraft "belly" ramps or handled by organic elevators.

Increased air movement of weapons and supplies will require better transportability characteristics for these items. The size of military equipment must either be kept small or designed for sectionalized shipment. At the same time weight must be reduced through the use of light-weight metals and plastics. Smaller equipment, weapons and supplies will be shipped in light-weight containers of sturdy construction and suitable for mechanical material handling.

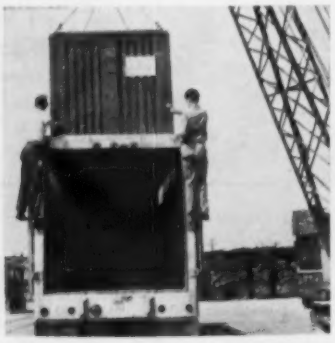
Increased movement by air is, of course, only one of the factors of logistic mobility. There will never be enough aircraft available to transport all cargo. In addition to the dictates of emergency requirements, air cargo will be selected on the basis of high unit cost, low bulk and weight, delicate nature of construction as well as on transit packaging and damage considerations.

Water and land transportation will remain essential. The majority of all heavy equipment, ammunition and fuel will continue to be transported to oversea areas by ship. Loading and discharging of ocean-going vessels will continue to be our largest material handling activity.

Conventional ports crowded with ships carrying essential military supplies and congested with ware-

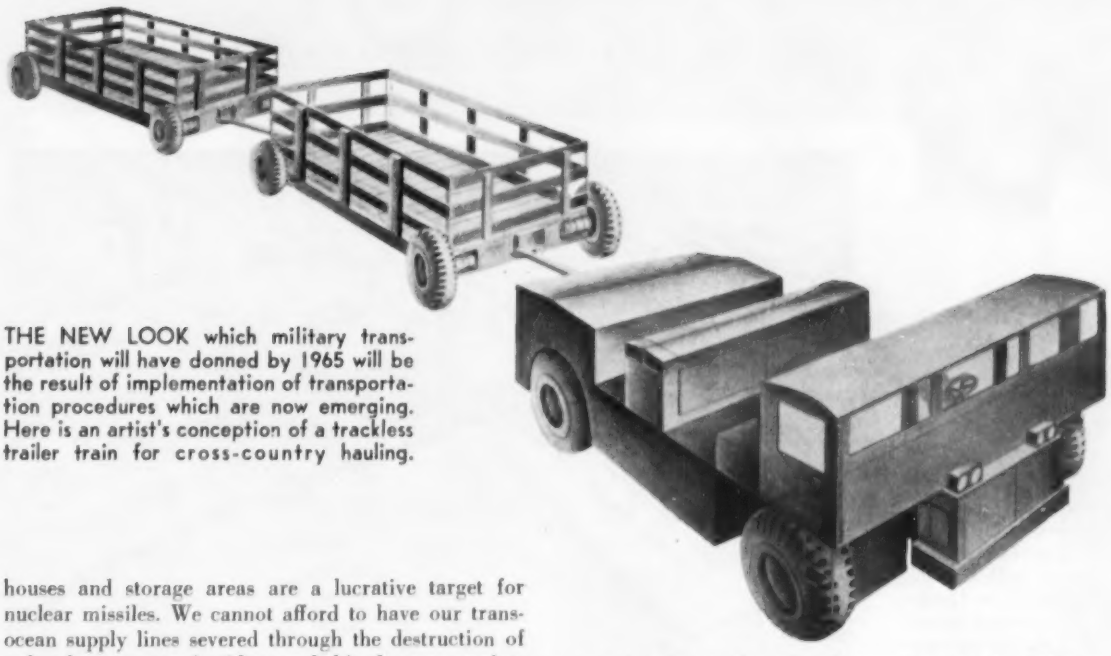


UNITIZABLE CARGO will be carried mostly in reusable steel cargo containers. Shown here are experimental units already under test by the Transportation Corps. They contain 295 cubic feet of cargo



space and carry loads up to 9000 pounds. Skids attached to the bottom and fixed lifting eyes on the four top corners facilitate handling by standard equipment. Recesses located on the edges of the

roof provide for easy stacking. The boxes will carry small machinery, sensitive equipment, spare parts, packaged and bottled subsistance items, PX goods, mail, and other similar material.



THE NEW LOOK which military transportation will have donned by 1965 will be the result of implementation of transportation procedures which are now emerging. Here is an artist's conception of a trackless trailer train for cross-country hauling.

houses and storage areas are a lucrative target for nuclear missiles. We cannot afford to have our trans-ocean supply lines severed through the destruction of a few large ports. Avoidance of this danger requires the dispersion of water terminal facilities. It means that we must spread out terminal operation to all available ports, including small ones and undeveloped beach sites.

In future conventional terminal operations more emphasis will have to be placed on the reduction of turn-around time of vessels to decrease the number of ships in port at any one time. To accomplish this—just as in air terminal activities—we will depend on automation to speed up loading and unloading.

Increased mechanization of material handling will be achieved through use of improved equipment such as hydraulically operated level-luffing cranes and through employment of new methods such as unitization of loads and roll-on roll-off of mobile cargo.

To introduce dispersion in conventional terminal operations we will utilize smaller ports either individually or as outports of a port complex. To increase their capacity we plan to supplement facilities with aerial tramway systems, the component parts of which are designed for convenient storage, transportability and ease of erection. A typical system will be two-tracked and extend from a point 400 yards inland to a pair of barges moored some 2,000 yards offshore.

It is expected that two 10-ton "skycars" running along traction cables supported by 75-foot steel towers will carry up to 80 long tons of cargo per hour, roughly equivalent to the capacity of a conventional small port.

"Packaged" Ports

The most effective *dispersion* in water terminals will be accomplished by establishing discharge sites at undeveloped beaches where operations may be accomplished either by means of "packaged ports" or by direct over-the-beach discharge.

The basic component of the packaged port is the DeLong Pier, a barge with installed steel caissons that are driven into the ocean bottom by air-jacks. Two or more of these barges with their own caissons and jacks, with cranes, conveyors, forklifts and other material handling equipment make up a packaged port.

The packaged port represents an easily transportable unit which provides basic pier facilities without large-scale, on-site construction. Besides its use as a terminal facility at the open shoreline, the packaged port may also be quickly towed into conventional harbors to replace destroyed docks.

To remove cargo from the packaged port, as well as for other purposes, we are developing a conveyor belt with a capacity of up to 270 tons per hour. A conveyor of this type will be used to move cargo from a DeLong or a conventional pier to storage or transfer points on the shore. It would run the length of the pier, thus facilitating discharge from lighters tied up on both sides.

Conveyors also will serve to transport supplies from beach dumps. At the terminus of the main belt smaller, sectionalized conveyors may be connected to haul cargo to different locations still further inland.

The basic components of test conveyor models consist of sections which are 20 feet long and 16 inches wide. The belt, made of rubber-coated wooden slats, moves at a speed of 75 feet per minute. Power can be supplied either by a gasoline engine or electricity.

It is anticipated that most cargo operations at undeveloped beach sites will be accomplished without the benefit of packaged ports. Much of the supplies will be brought ashore from vessels lying off-shore and transported across the beach by amphibious vehicles. The heavier and more cumbersome cargo will be taken to the edge of the waterline by landing craft and specially designed lighters.

On the basis of the famous 2½-ton World War II DUKW, the Army is developing larger, faster and

(More on next page)

PACKAGED PORTS will be towed in to replace destroyed conventional facilities. Cargo will be unloaded from landing craft and barge directly on conveyors leading inland.

more versatile carriers for amphibious re-supply operations. They are the Superduck (4-ton), the Drake (10-ton) and the giant BARC (60 tons). Prototypes of the Superduck and the BARC are undergoing field tests while the Drake is still in the drawing board stage.

These amphibians have the capability of continuing movement on land after reaching the shore line and thus keep supplies from cluttering up the beach. Landing craft and lighters must discharge their cargo at the waterline.

Instead of dumping cargo on the beach, as was customary during War II, we expect to get it on its way inland immediately by way of beach conveyors and trucks. For this task we need material handling equipment which can operate freely and efficiently on either soft sand or rocky ground.

To meet this requirement the Army is developing a rough terrain fork lift truck. We have tested a 6000-ton and a 10,000-ton type and expect to have heavier models available soon.

The rough terrain truck is a versatile piece of equipment. With low pressure tires it can travel over soft sand to landing craft at the waterline, lift out a pallet of cargo and carry it to a truck or conveyor and lift it aboard.

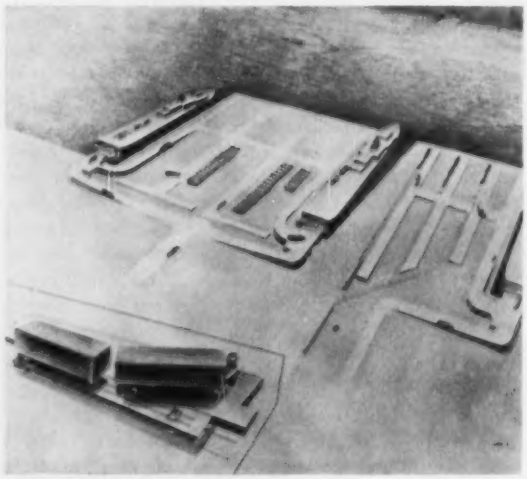
Transportation Efficiency

The Transportation Corps' responsibilities do not, of course, end with the loading or discharging of military cargo. In the United States we depend upon the civilian carriers to transport military supplies between manufacturers, ports of embarkation, depots and using units. Overseas we employ both indigenous transportation services and military transportation media. In overseas areas during wartime, we depend largely on military transportation services.

In the future we will perform military land transportation as in the past but will do so with greater flexibility. By this I mean that we will spread the traffic over many types of transportation media. Thus, if one medium is destroyed we will quickly shift movement requirements to others.

The flexibility we desire calls for railroad equipment which can roll on different sizes of standard

(Continued on page 190)



ROLL-ON ROLL-OFF method of cargo handling will be employed wherever possible. Artist's conception of port terminal facilities specially designed for roll-on roll-off type vessels includes provision for piggy-back.

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TAPED BOXES

ARE BEST

You get even corners for good stacking . . . greater safety for the handler . . . better sealing against dirt and dust . . . no damage to merchandise — a hazard from other methods of closing. Yes, taped boxes are best — and best of *all* when made with non-asphaltic, glass reenforced LOKABOX, strongest of them all — or SISAL TAPE, standard of the industry.

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track. It requires motor vehicles suitable for cross-country operations regardless of terrain conditions. It demands greater utilization of inland waterways.

The Army is developing adjustable and adaptable equipment. We have tested and are now procuring multi-gauge locomotives and rolling stock; we are experimenting with automotive vehicles capable of traversing snow and ice covered surfaces, marsh lands and deserts. We have developed a prototype cycloidal propelled towboat and transportable, sectionalized barges.

In addition to this type of equipment, the Army will count heavily on Army aircraft for greater flexibility in transportation. We think of cargo helicopters and the convertiplanes as basic transportation media as are trains, motor vehicles and marine craft. We hope that by 1965 we will have a sufficient number of transportation helicopter companies to permit a free intermedia transfer of cargo movement missions when climatic conditions, topography or the military situation so dictate.

Flexibility Important

I consider flexibility an extremely important factor. We not only require it in equipment and in its use, but it also applies to individuals and organizations. Transportation Corps soldiers and units must be flexible. For example, military terminal detachments must be equally capable of handling cargo in conventional ports, over undeveloped beaches or at air terminals. Through formal schooling, field training and selective assignments we hope to condition men and units to greater mental flexibility.

The new look which our operations will have donned by 1965 will also be the result of the implementation of transportation procedures which are now emerging. These changes tie in with the other factors enumerated here but are of distinct origin.

We have found that increasing the speed and efficiency of carriers and material handling equipment

One of the twelve strapping stations set up by Quaker Export Packaging Co. to handle "Operation Poinsettia."

Signode power machines strap 600,000 cartons of food for export in 30 days!

Start November 14th and package 3,592,500 food parcels for shipment overseas in time for Christmas? It was done—in an amazing demonstration of fast organization and sustained effort, with the parcels packed six to a carton, cartons sealed, and reinforced with two steel straps.

Says Benjamin Bernstein, President, Quaker Export Packaging Co., Inc., Philadelphia, "In approximately thirty working days we applied over 1,250,000 straps. During the entire operation there was no major breakdown. This proves the excellence of the design and engineering of the machine, and the excellent service and installation."

This is unitizing on a big scale (and on a hurry-up basis . . . in little more than a week after the first call from Quaker Export, Signode had delivered the power strapping machines and set them up for operation).

Dependability—and experienced, helpful follow-through—are part of every item in the complete line of Signode hand and power tools for tensional steel strapping. For additional information, or a survey of your needs, write,

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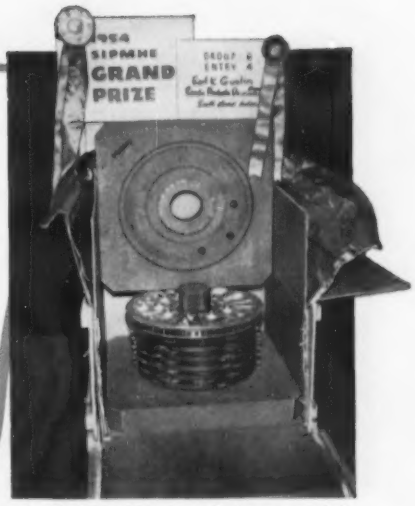
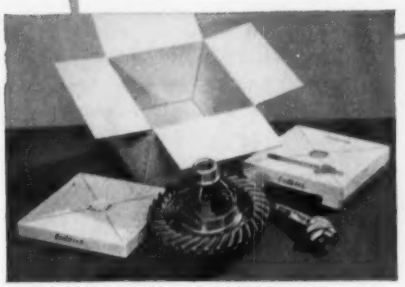
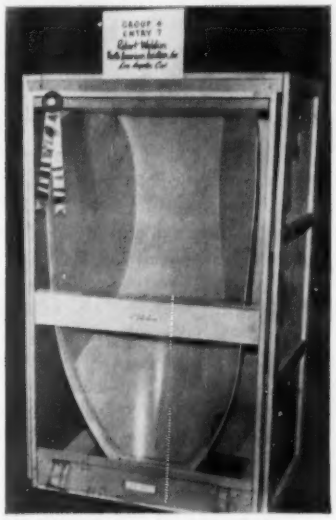
Celotex prize-winning packs show how you can cut packaging costs!



Grand Prize-winning pack shows prefabricated Celotex Fiber Board inner packs contoured to exact lines of aircraft brake surfaces for snug, immobile fit.



Gear is block-packed in this prize-winning pack with 80% reduction in packaging time. Note cut-out for trap-positioning of pinion gear.



Another prize-winning pack: Design prevents "cold flow" of aircraft cockpit enclosure by securely 'trapping' all edges in prefabricated contours of Celotex packs.

Winners in SIPMHE Shows made with Celotex Neutral pH Industrial Board

This "Best of the Show" pack, the Grand Prize winner itself . . . plus these two division prize winners — all users of engineered, prefabricated inner packs of Celotex Industrial Neutral pH Fiber Board!

No wonder they won top awards at the SIPMHE Packaging Shows: These packs were designed for packaging and shipping of valuable contents with minimum weight and cost and in maximum safety. And no better way could be found than with Celotex Fiber Board inner packs, which . . .

- **Brace, Block, Cushion!**
- **Lower Packaging Costs!**
- **Prevent Damage!**

Does your operation include domestic or overseas shipment of difficult-to-pack, expensive, irregularly-shaped equipment or parts? Are packaging costs or damage in handling cutting into your profits? Celotex Fiber Board inner packs could very well be your solution.

Precision Fabricated as Required

Manufactured from long, tough interlocked Louisiana cane fibers, the strong Celotex board from which inner packs are made is extremely light and resilient. Because it can be prefabricated to exacting product contours, it tightly braces, position-blocks, and cushions with gentle firmness, preventing movement and impact damage. Its rigidity, strength, and cushioning not only provide optimum protection but often make the use of lighter, less costly outer containers completely practical.

Outstanding physical characteristics of strong yet lightweight Celotex Fiber Board: Has a neutral pH value (6.5-7.5); this low acid-alkali content is helpful in minimizing corrosion when in contact with metals. Moisture content is between 5% and 8% by weight, far less than most inner pack materials, requiring less costly desiccant.

Locally engineered prefabricated Celotex Industrial Cane Fiber Board inner packs can help solve your problems of limited packing time and shipping space . . . can substantially reduce your labor and damage costs. *Name of your nearest servicing fabricator on request.* For full data, mail handy coupon today!

For proven packaging at its quick best . . .

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120 South LaSalle Street, Chicago 3, Illinois

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☐ Please furnish me a copy of the Celotex cushioning nomogram.

Name ..... Position .....
Company ..... Address .....
City ..... Zone ..... State .....

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Angier

A STATEMENT:
by the Originators of Center Seam Sealing
RE: Uniform Freight Classification Rule 41

Rule 41 Amended
to permit center-seam sealing

• **Important to all who ship products in cartons** is the recent announcement by the Official Classification Committee, relative to Uniform Freight Classification Rule 41.

This regulation, amended by the addition of Paragraph 6, Section 7, gives official recognition to the technological advances in the manufacture and composition of reinforced gummed tapes. Now,* products may be shipped by rail in corrugated boxes meeting Rule 41, Section 2 and 3, sealed with 2 strips of reinforced tape provided such tape meets the new U. F. C. standards.

The requirements of the new amendment are clearly stated. To be acceptable, a reinforced tape, used for center seam sealing, must have a performance test at least 35% greater than 60# paper sealing tape applied on all six seams of acceptable corrugated boxes. The tape must pass strict tear and tensile strength requirements. It must be manufactured with a weather resistant laminant.

Angier SNAKE TAPE, *the original reinforced tape,* meets and exceeds without qualification all of the standards established by the O.C.C.

• **Importance of Two Strip Sealing.** Until the Committee's action, many industries were restricted to the use of six-strip plain tape closures, glued closures, or stapled closures for rail shipment of their product. Now, center seam sealing will assure you stronger carton closures at a saving.

Angier Corporation has long advocated the use of this simpler, more economical closure method. Proven by test, SNAKE TAPE center seam sealing provides carton closures more than 35% stronger than six strip sealing with non-reinforced gummed tape. And it reduces packaging time and labor up to 66⅔%!

Center-seam sealing—the 2 strip method — affords *fully automatic application of tape at production line speeds—never before practical under the former 6 strip requirements of Rule 41.*

• **Rayon the Best Reinforcing Medium.** Angier SNAKE TAPE is the *only* tape reinforced with *rayon* cords for all-directional strength. Rayon is used by Angier because it possesses the important characteristics of extensibility and toughness capable of absorbing heavy shock.

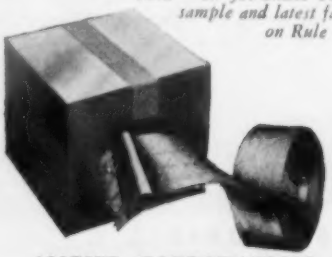
High tenacity rayon cords, imbedded between double-ply kraft, are the same reinforcing fibers used in auto tires to assure long road wear and maximum shock resistance.

Over the years, Angier engineers have developed a process for laminating these cords in such a pattern as to afford closures with all-directional strength. SNAKE TAPE's well-known diamond-longitudinal pattern affords maximum resistance to cross-tear, down-tear and torque stress, and helps ensure safe, damage-free shipment of corrugated boxed products.

Since the introduction of SNAKE TAPE, Angier has led the way to greater economy and stronger closures with center-seam sealing. Now, with the new amendment, all shippers regulated by Uniform Freight Classification Rule 41 may profit by this more efficient, reliable packaging method. And in SNAKE TAPE, they will find the only sealing tape on the market reinforced with Rayon, making it the *finest* of all reinforced tapes.

• **Let center seam sealing with SNAKE TAPE do *your* packaging job better—more economically!**

FREE — *15 yd. Snake Tape sample and latest facts on Rule 41.*



ANGIER CORPORATION
Framingham 13, Massachusetts

* *For exact effective date, see U.F.C. supplement amending Rule 41.*

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will quicken the flow of supplies, but will not substantially decrease costs or reduce in-transit time as much as is desired. We have concluded that far-reaching improvements in transportation can be made only by the introduction of new concepts in material handling. To state it in simple terms: we want to apply assembly-line methods to cargo movement.

We have not had "mass production" efficiency in military transportation in the past because we lacked a standard product to which assembly-line methods could be applied. However, we have now identified two groups of cargo in this category. One is mobile equipment; the other consists of all material which is suitable for container shipment.

Cargo Handling

To take advantage of the mobile quality of wheeled and tracked vehicles and weapons, which account for 25 per cent of military cargo, we intend to employ the roll-on roll-off method of cargo handling.

Thus under ideal circumstances all cargo in this group will be rolled aboard ships in the United States and rolled off at oversea destinations. Tanks, trucks and tractors should roll on and roll off like troops walk on and walk off and fuel flows on and flows off.

Successful roll-on roll-off operations will depend on the availability of specially constructed vessels and terminal facilities. It is estimated that with the availability of such facilities a full load of mobile equipment can be loaded or discharged within eight hours.

The Transportation Corps is concerned with the utilization of roll-on roll-off in over-the-beach discharge. Our research engineers have designed a large beach lighter for this purpose. This vessel will be 300 feet long, have about 15,000 square feet of deck space, and is primarily intended for use in ship-to-shore operations. Its 600-ton capacity will permit it to carry cumbersome mobile materiel such as heavy tanks, large artillery pieces and bulky engineer construction

This engineered wirebound combines lightness that cut shipping weight from 865 to 759 pounds with strength for lift truck handling and warehouse stacking.

General Box containers are engineered for easier materials and product handling

Strong, light, rugged—Generalift pallet boxes and General wirebounds save shipping weight and money. But what makes them tops for your needs is custom engineering by General Box. They're designed to become a part of the handling operation with details like skid bases for fork-lift pickup, sturdy construction for stacking strength, balanced designs for loading and handling, special top cleats for finger-lift handling, quick, easy closing for assembly line packaging.

General's design specialists, with completely equipped design and testing laboratories at their disposal, consider your materials, products, *handling methods* . . . then design the box with the most utility . . . least cost.

ENGINEERED CONTAINERS FOR EVERY SHIPPING NEED

• Wirebound Crates and Boxes • Generalift Pallet Boxes • Corrugated Fiber Boxes • Cleated Corrugated and Watkins-Type Boxes • Stitched Panel Crates • All-bound Boxes

Take advantage of the unexcelled container engineering service offered by General Box. Fastest, easiest way is to let us send a man. Ask for free copy of illustrated Pallet Box issue of "General Box."

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General Box

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reduce breakage of bagged, canned or bottled goods

Recommended for use in shipping such products as: —

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- Vegetables
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- Spaghetti
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Big reductions in costly damage to goods in transit are now accomplished by *Unitized Loading* with Thilco WRAP-Dri Retaining Papers. Papers developed by Thilmany and recommended by the American Association of Railroads keep unit loads intact and reduce shifting to the minimum. Loads are tighter, more stable and better withstand humpage. Any wet damage from broken bottles is localized in the car. Full information on money saving *Unitized Loading* is yours for the asking. The complete brochure of sample paper grades, instructions and diagrammatic illustrations will help you save costly claim adjustment expense and build goodwill for your organization. Write for copy today.

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equipment, all of which are too big for efficient handling by landing craft and amphibians.

The other group of cargo to which assembly-line methods can be applied is composed of the 40 percent portion of military supplies and equipment which can be fitted into an 8′ x 6′ space. We are unitizing this cargo by shipping it in containers or on pallets which remain an integral part of the load from vendors' plants or depots until destination.

Most of the unitizable cargo will be carried in reusable steel cargo transporters developed for the Transportation Corp. These containers contain 295 cubic feet of cargo space and carry loads up to 9000 pounds. Skids attached to the bottom and fixed lifting eyes on the four top corners facilitate handling by standard equipment. Recesses located on the edges of the roof provide for easy stacking.

"Suitable" Cargo

Some of the most suitable cargo for containerization consists of small machinery, sensitive equipment, spare parts of all kinds, packaged and bottled subsistence items, Post Exchange goods and mail. The cargo transporter also is ideal for the shipment of military impedamenta and personal effects in support of troop movements. It is suited for this type of cargo since it is practically pilferage-proof, offers protection from the elements, reduces loss and damage and simplifies cargo checking as well as transportation documentation.

Use of cargo containers also results in getting more cargo aboard carriers since space formerly taken up by packaging material can now be occupied by additional cargo.

In addition to these advantages, the Transporter is tailor-made for in-transit mechanized handling on land and for ship-to-dock movement at water terminals. With the increased availability of these steel containers and optimum utilization, we expect to speed up cargo movements and at the same time greatly reduce handling expenses.

Do You Have Safety Problems in Your Business?

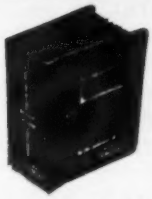
Here's the Answer!

If you employ people, you *have* safety problems. And they can be mighty expensive ones. Injuries and illnesses cost you money two ways: 1) work-sustained disabilities are compensated for, according to your state law, out of your pocket; 2) absence from the job costs even more in lost production, training replacements.

Safety can cut your costs—no matter what business you're in, regardless how many people you employ. And here's your guide to dollar savings through accident-prevention. Its 10 separate sections cover every phase of industrial safety and health, from Aluminum dust hazards to Zirconium's toxic properties.

It will tell you what the dangers are and how to eliminate them from your operations.

The Industrial Safety & Health Handbook is bound in a heavy-duty binder—and it has to be. It's made for continual, rough use: you'll soon find it the most valuable book on your desk. Its nearly 300 pages are indexed and color-tabbed for fast reference. You can get an immediate answer to any safety or health problem that arises. If you have no safety engineer, you'll need this book more than ever.



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The Handbook gives you an immediate answer to any hazard elimination. It gives you fast non-technical information on hundreds of safety and health threats—and tells how to prevent them.

The Handbook is a compendium of all phases of safety education, written in non-technical language. Valuable source material for seasoned safety men, ideal background for men new to safety work.

This Handbook, published by Industrial Book Co., has been written and prepared by its affiliate, Occupational Hazards, Inc.

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is quick . . . accurate. Your carton supplier imprints Panl-Labls . . . you just mark in the address. Squeeze-feed plastic ink bottle is screwed into the applicator base and becomes the handle of the most economical marking device you can buy.

IF YOU SHIP TO WHOLESALERS

. . . you can have your cartons pre-printed with extra Panl-Labls. For re-shipment, your wholesaler obliterates his address and marks in his customer's with the handy STEN-C-LABL.

LABELS IMPRINTED . . .

as fast as you can stamp them . . . as many as you need from a single stencil. STEN-C-LABL provides a neat typed address at all times and eliminates laborious re-typing. You will have no more errors in addressing.

Stencil paper is held to inked rubber pad by viscosity . . . no clips or attachments are necessary.

STEN-C-LABL IS NORMALLY PREPARED IN THE OFFICE AS A BY-PRODUCT OF THE NORMAL INVOICE, ORDER, OR S/L TYPING.

SEND FOR FREE DESCRIPTIVE LITERATURE

STEN-C-LABL, INC.
2285 UNIVERSITY AVENUE
ST. PAUL 14, MINNESOTA

SERVANT OF LABOR . . .

(*Continued from page* 109)

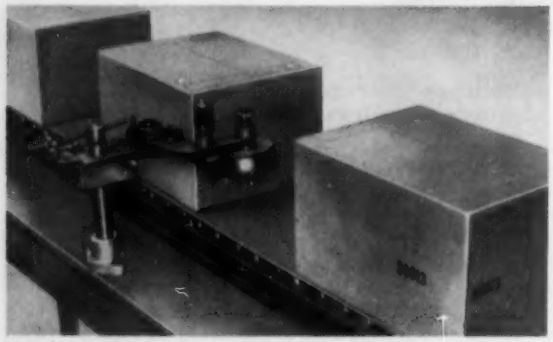
never will develop a push-button driver, we do have hundreds of thousands of members who are working in warehouses, canneries and production plants and will be affected.

These people are the ones who will eventually feel the effects of automatic machinery, just as it has already been felt in our economy as a whole and especially in steel, oil, and automobile manufacturing.

For example, last year our national production rate increased 5 percent while overall employment decreased 4 percent. The steel industry, in January, actually employed 42,000 workers less than it did a year ago, but, in the meantime, the ingot production rose 8,838,000 tons—up 11 percent.

Automobile makers are currently rolling nearly 50 percent more cars off their assembly lines with an increase of only 5 percent in

Now...mark all 4 sides of cases automatically... *in a single pass*



Twin-action Gottscho ROLACODER Markers attach to conveyor or case-sealer

New friction-driven marking attachments enable you to mark codes or lot numbers on 2 or 4 panels of corrugated cases as they are sealed or conveyed... without requiring cases to be turned. ROLACODER *500* marker imprints front and one side panel, ROLACODER *200* unit imprints rear and other side panel — mounted in tandem they mark all 4 sides simultaneously. ROLACODER markers use quick-change rubber type, hold 8-hour ink supply; are designed for easy do-it-yourself installation.

Write for descriptive literature

Gottscho **ADOLPH GOTTSCHO, INC.**
Dept. D, Hillside 5, N. J.

Automatic CODING, MARKING, IMPRINTING MACHINES

In Canada: RICHARDSON AGENCIES, LTD., Toronto & Montreal

Circle No. 146 on Reader Service Card for more information

Let us show you How/PHONE or WRITE

ALLEGHENY STEEL BAND COMPANY
BOX 716, PITTSBURGH 30, PA. • WAlnut 1-7100

Circle No. 24 on Reader Service Card for more information

employment over last year. In the oil industry, 137,000 workers are now producing 22 percent more than 147,000 workers did seven years ago.

A recent government estimate of conditions in 1965 listed some of the benefits which can come out of automation in the next ten years.

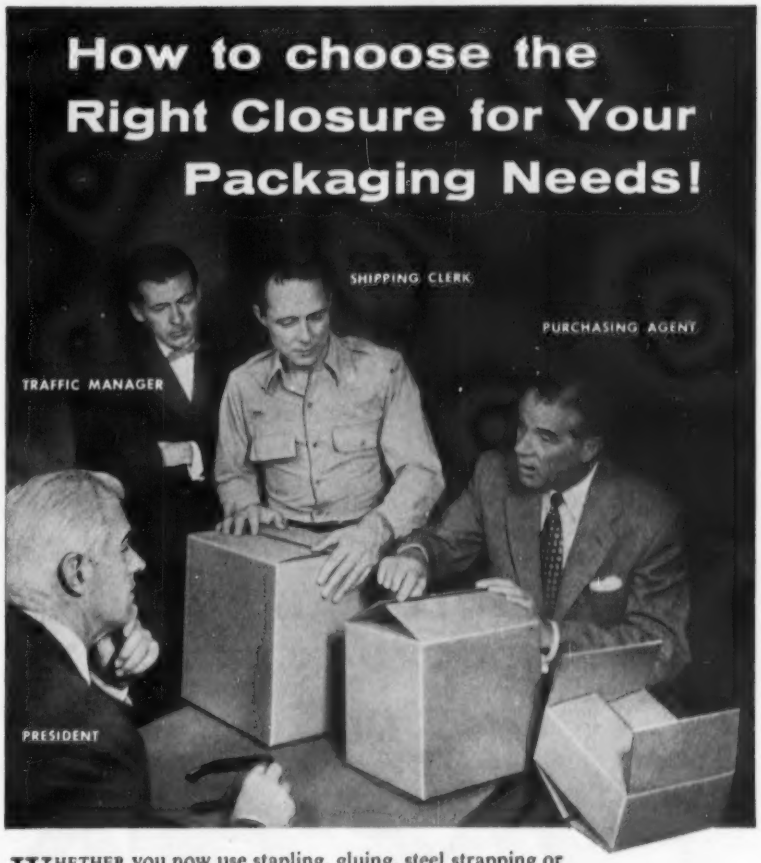
More Benefits in '65

It said the average workweek would drop to 35 hours, while worker efficiency would increase 30 to 40 percent. There will be longer vacations, more holidays and a definite possibility of a 3-day weekend. The average income, which is now $5,400 a year, will rise to $6,800. Most of this increase will go into buying the good things of life. The government experts estimate 73 million people at work, 13 million more than are now employed. Spending for industrial plants and equipment will exceed a billion dollars a week—more than half again what it is now.

This chance to cash in on economic abundance is ours if we can learn from the mistakes of the First Industrial Revolution. We must realize that God did not make man to be a servant of the machine; if man becomes enslaved it is because of his own stupidity.

Management must develop a feeling of humanity; it must not concern itself only with the making of a "fast dollar" without considering the effect on its workers and its consumers. The consumer must benefit through lower prices and higher quality. Labor must team with Government to control this phenomenon through legislative action and collective bargaining.

Labor, too, will be ever on the alert to get increased benefits for its members. Labor realizes that we must maintain an expanding economy to take care of our ever-growing nation. But it also realizes that workers must get their adequate share of increased productivity. The working men and women of America will accept automatic machines only as long as they benefit from them by higher standards of living, shorter working hours, and more security for themselves and their families.



WHETHER you now use stapling, gluing, steel strapping or gummed sealing tape as a closure, Hudson has an improvement to give you more speed, more efficiency, more protection, and more economy too! Select one of these products and let us send you a free testing sample:

FAST WELD for speed in *two-strip* production line sealing*—an overall center seam protection that beats stapling, stitching or gluing. The fastest, most labor-saving closure possible. Reinforced in both directions with Fiberglas®, *Fast* Weld comes to you with an extra heavy coat of Hudson's exclusive adhesive — Supple-ized® for easier handling.

*Authorized by amended U.F.C. Rule 41

BLUE RIBBON for *speed in complete closure.* The *quality* tape with incredible speed of adhesion. Just one fast sweep of the hands and you get a tighter, more permanent seal against dust, smoke, moisture, vermin. The secret — Hudson's exclusive adhesive, Supple-ized to give you instant full depth moistening . . . quicker, better sealing.

ORANGE CORE for *low cost standard sealing.* Every inch on every roll sticks with the same bulldog grip because Hudson controls all its ingredients. Hundreds of thousands of users depend on Orange Core's consistently superior quality and have made it the world's largest selling gummed sealing tape.

Quality Products by

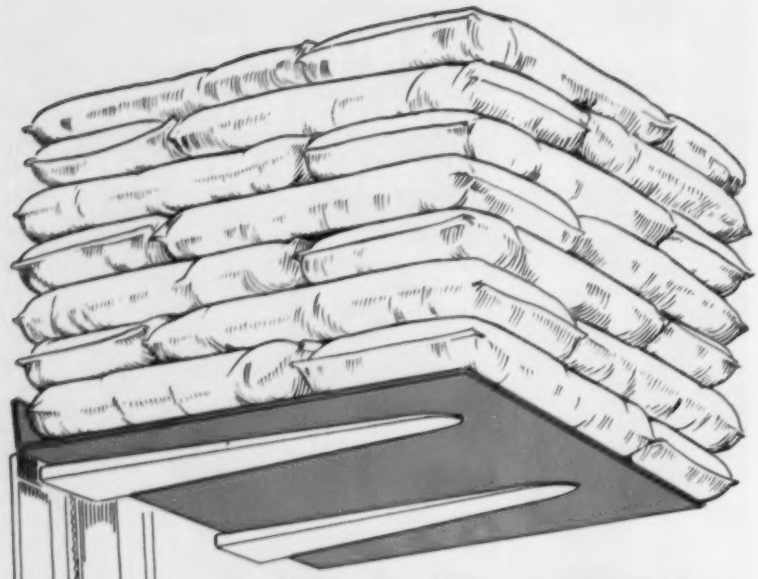
Hudson

PULP & PAPER CORP.

477 Madison Ave., New York 22, N.Y.

P.S. On your letterhead—write Dept. F-5 and tell us which product you want to free-test . . . Fast Weld, Blue Ribbon, or Orange Core!

Circle No. 162 on Reader Service Card for more information



HOLDS ANY WEIGHT YOUR TRUCK CAN LIFT!

Chestnut

POKE-PAK

costs so little it's expendable

MEAD board

Poke-Pak isn't half so thick as your shoe sole, but it's tough and rigid and supports any unitized load of bags you can lift. Free from splinters and nails that snag bags and spill contents.

It costs so little that it can be thrown away, saving return freight, credits, charge-backs. Poke-Pak is made from Chestnut and other hardwood fibers, holds that load as if it owned it, keeps center of gravity low and avoids tipping. Loads and unloads better, at a fraction of the cost.

FREE CONSULTANT SERVICE. Call our nearest office for carloading diagrams, bag patterns, samples of Poke-Pak. You'll like the savings in time, effort and money with Poke-Pak, the ultimate in unitized handling.

MEAD BOARD SALES, INC.
River Road, Lynchburg 2, Virginia

SALES OFFICES:
CINCINNATI 9, OHIO ..... 3347 Madison Road
CHICAGO 30, ILLINOIS ..... 6124 N. Milwaukee Avenue
NEWARK 2, NEW JERSEY ..... 10 Commerce Court
DETROIT 35, MICHIGAN ..... 18045 James Couzens Highway
BOSTON 10, MASSACHUSETTS ..... 43 Leon Street

POKE-PAK COSTS SO LITTLE IT'S EXPENDABLE

Circle No. 204 on Reader Service Card for more information

CONFERENCE . . .

(*Continued from page* 137)

Speakers—"*Methods for Cost Control of Material Handling.*"
Colonel John B. Day, School of Industrial Engineering, Georgia Institute of Technology

"*Packard Motor Car Company's Material Handling Problem.*"
John G. Anderson, Material Handling Engineer, Studebaker-Packard Corporation

"*Approach to a Materials Handling Problem.*"
Richard H. Weingartz, KenDick Corporation Moline, Ill.

Panel Members—Jack Christenson, Industrial Engineer, Department Head, Reliable Electric Company

Wilbur D. Warner, National Manager, Material Handling Division, Sears, Roebuck Company

Douglas A. Gillespie, National President, AMHS.

Panels B & C—1:30 P.M. to 3:00 P.M.

Panel discussions.

PANEL D

Wednesday, May 18 (9:00 A.M. to 12:00)

Integrating the Materials Handling System with Plant Facilities:
Plant Layout for proper handling. Problems of old and multi-story buildings. New building design for modern handling equipment.

Moderator—Norman B. Shikes, Manager of Materials Handling, Radio Corporation of America

Speakers—"*Problem of Old and Multi-Story Buildings*"
James R. Bright, Lecturer on Industrial Management, Harvard University

"*Integrating Two-way Radio with Modern Plant Facilities*"
Harry G. Boyle, Manager of Communications Field Sales, Radio Corporation of America

"*New Building Design for Modern Handling Equipment*"
Edward J. Slygh, Project

Engineer, Campbell Lowrie Lautermilch Corporation

Panel Members—L. A. Severseu, Warehouse & Shipping Supervisor, Central Scientific Company

John R. Wells, Jr., Materials Handling Engineer, Glenn L. Martin Company

James J. McCabe, Chief Industrial Engineer, American Maize Products Company

1:30 P.M.-3:00 P.M.
Panel discussions.

PANEL E

Wednesday, May 18 (9:00 A.M. to 11:00 A.M.)

Materials Handling from Origin to Destination: Bulk shipments in bulk containers, self-contained unit loads. Water, rail and over-the-road carriers.

Moderator—John G. Bucuss, President, Acme Steel Products Division.

Speakers—"*Use of Pallets from Origin to Destination*" William H. Sardo, Jr., Secretary-Manager, National Wooden Pallet Manufacturers Association.

Block, brace, inter-leave and wrap with low cost, flexible SOF-RAP

Protect refrigerators, stoves and other enameled or high finished products from scratches, abrasion and shock with SOF-RAP. Soft and light as a feather, yet plenty tough! Complete 4-Way flexibility readily conforms to any shape. Use single sheet TYPE C for interior cushioning against shock and vibration — Type B duplex with cushion inner-sheet strip laminated to tough, durable kraft outer-sheet for exterior wrap — It permits slippage, reduces friction damage. Low cost SOF-RAP comes in rolls, sheet, tubes or bags in several thickness weights.

SOF-RAP safeguards your products from:
SHOCK • CRUSHING • CHIPPING
SCRATCHING • ABRASION
VIBRATION • BREAKAGE
AND BOUNCE

Write for this helpful booklet and samples. Test-try SOF-RAP today!

NICHOLS
PAPER PRODUCTS COMPANY
GREEN BAY · WISCONSIN

Circle No. 219 on Reader Service Card

Circle No. 166 on Reader Service Card for more information

WHY
IDEAL
AUTOMATIC STENCILING CUTS SHIPPING COSTS:

- Automatic character, word and line spacer increases speed and production.
- Saves at least 20% in stencil board.
- Cushioned hand wheel and handle, safety hood and other features make the Ideal easier to use —saving labor costs.
- Exceptionally long life —many Ideals have been in service over 20 years.

The Ideal will help cut costs in your plant. Write for free trial to . . .

IDEAL STENCIL MACHINE CO.
106 IOWA AVE., BELLEVILLE, ILL.

THE MOST TALKED ABOUT GUMMED TAPE DISPENSER ON THE MARKET!

THE MEDIUM PRICED
Super
DERBY "152"

PRICED FAR LOWER THAN ANY COMPARABLE MACHINE!

Derby spent 2 years designing, building and testing the fabulous Super "152." It's a rugged, efficient, gummed tape dispenser with so many big machine features, so many unusual Derby exclusives, that its low price is truly sensational!

See your dealer or write Dept. F

DERBY SEALERS INC. Derby, Conn.

A Derby First!
Cut-Off Blade Guaranteed for the Life of the Machine!

- Exclusive Spring Clutch Feed
- Feed Stop for Predetermined Lengths up to 30"
- Dispenses 1" to 3" width
- Auxiliary Water Reservoir
- Single Brush Moisture Control System
- Adjustable Variable Length Slotted Handle
- Interlocking Side Frames
- Automatic Tape Cut-off
- Visual Measuring Scale

Circle No. 107 on Reader Service Card for more information

PRINT OR CODE YOUR GUMTAPE BY SIMPLY ADDING "THE TAPE PRINTER" TO YOUR PRESENT EQUIPMENT

A quick method of marking to identify contents or for general advertising uses on YOUR OWN GUM TAPE . . . Fast, Effective. Prints as you use your machine for all shipping packages. Ideal for all types of business. Now being used by a host of leading concerns everywhere. A time, money and labor saver
There is a Tape Printer to fit any 3" standard automatic machine made to take gum tape from 1½" to 3" . . . with models available for quick change of copy for coding, identifying, dating, etc.

Complete with permanent copy

$31.75 F.O.B N.Y

Mechanically Simple • Engineered for Long, Hard Use • Eliminates Need for Large Inventory • Codes and Padlocks Contents • Self Inking • Instant Drying • Prints up to 12" of copy • Quick Changeable Type

Write for information and descriptive literature

AMERICAN TAPE PRINTER CO.
Distributor of the "Tape Printer"
678—6th Avenue New York 10, N. Y.

Circle No. 43 on Reader Service Card

CONFERENCE

Continued

"Future of Materials Handling for the Railroads."
Edward J. Kehoe, Consultant-Office of President, New York, New Haven and Hartford Railroad Co.

"Use of Rubber Balloons and Their Effect on Bulk Handling."
Addison Brown, President, O-T-D Container Corp.

Panel Members—John Velardo, Packaging & Shipping Editor, FLOW Magazine

Herbert H. Hall, Aluminum Company of America.

Leroy F. Skubic, President, Paltier Corporation.

PANEL F

Wednesday, May 18 (11:00 A.M. to 12:00)

Yard Handling: Use of heavy mobile equipment for yard operations.

Moderator—Edward J. Kolk, Plant Manager, United States Homes

Speakers—*Problems Encountered in Yard Operations"*
Wade Meloan, Director of Sales, Pettibone Mulliken Corp.

"The Lumber Yard Unit Load Program for Most Effective Distribution."
John Moeling, President, Sterling Lumber & Supply Co.

"Modern Handling Methods as Applied to Scrap Metal Yard"
Norman L. Pinkert, Peoples Iron & Metal, Chicago

Panel Members—Frank C. Wier, Superintendent Material Handling, Timken Roller Bearing Company

Richmond F. Bancroft, Mid-West Manager, Modern Materials Handling

J. D. May, Customer Service Project Engineer United States Gypsum Company.

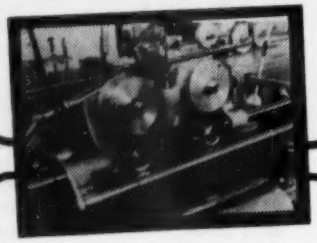
Panels E & F—1:30 P.M. to 3:00 P.M.

Panel discussions.

Circle No. 169 on Reader Service Card

MORE FOR YOUR MONEY FASTER . . .
with Industrial's Rainbow Coder

For one penny, the Rainbow Coder automatically produces from 20-40 square inches of sharp, clear, quality-controlled color imprinting on cellophane, glassine, waxed paper, foil . . . . any material that accepts hot roll-leaf imprinting. Easily



attached and synchronized to all types of continuous and intermittent wrapping machines. For complete details on how you can get faster, accurate and more economical production line package identification, write today for free 24 page catalog. Dept. F.

Industrial Marking Equipment COMPANY, INC.
454 Baltic Street, Brooklyn 17, New York MAin 4-2601

to SAVE MONEY on POSTAL SHIPMENTS in SMALL PACKAGES

Get your free copy today—Write Dept. F3

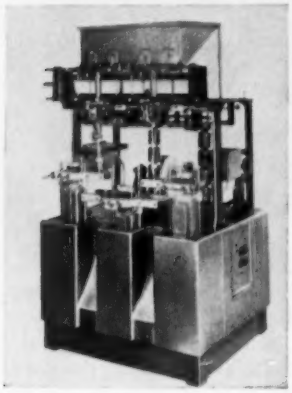
THE Mason BOX COMPANY
ATTLEBORO FALLS, MASSACHUSETTS
...and a complete line of display boxes.

Circle No. 203 on Reader Service Card

PACKAGING & SHIPPING
NEW EQUIPMENT . . .

(*Continued from page* 182)

Simplified Automatic Packaging Machine



Moving parts have been reduced and components have been designed as packages to permit easy installation, maintenance and removal in the Robo-Wrap Automatic Packaging Machine. A development of the Counsel Machine Co., the machine will automatically form, fill and seal pillow-type bags of various flexible packaging materials. The manufacturer reports that it is a result of years of design effort and discussions with many companies.

Circle 314 on Reader Service Card for more information

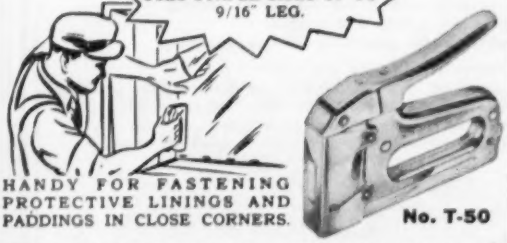
Low-Cost Hopper and Counter

A versatile, high speed hopper and counter, engineered to sell for less than $1,000. has been

ARROW TACKERS

FASTER, EASIER, NEATER, MORE EFFICIENT

3 MODELS TO CHOOSE FROM. USES STAPLE SIZES UP TO 9/16" LEG.



HANDY FOR FASTENING PROTECTIVE LININGS AND PADDINGS IN CLOSE CORNERS.

SOLD AT HARDWARE, BUILDING, LUMBER DEALERS AND INDUSTRIAL TOOL SUPPLIERS. WRITE FOR CATALOG

ARROW FASTENER CO., INC.
ONE JUNIUS STREET, BROOKLYN 12, N. Y.

Circle No. 51 on Reader Service Card for more information

Faster, better reinforcement for PARCEL POST*...

TAPE-STRAP®

Gummed Filament Tape

Shipping room production stepped up when Chicago Screw Company switched to Tape-Strap reinforcement. Heavily loaded containers are sealed with ordinary gummed tape, then reinforced with super-strong ½" Tape-Strap.

The Tape-Strapped packages look better, and protection is more effective. Previous reinforcement . . . two all-around wire strands . . . went on under tension, often cut into containers. Now, only four short strips of Tape-Strap, applied without pressure, provide all the reinforcement needed.

Chicago Screw Company also uses Tape-Strap reinforcement on express and truck shipments. Tape-Strap can't damage the containers and is safer to use. There are no sharp cutting edges. Because Tape-Strap goes on without tension, there's no chance of a spring back, and injury to personnel. No special application equipment is needed.

Find out now how you can cut packaging costs with Tape-Strap. *Write for free sample roll and complete data.*

*Approved April 27, 1954—Postal Bulletin 19735, Page 4

LEADERS IN THEIR LINE

MID-STATES Gummed Paper Company
2511 S. DAMEN AVE., CHICAGO 8, ILLINOIS

Circle No. 209 on Reader Service Card for more information

STAPLING A CARTON
THE FAST, EASY WAY
with Air!

New DUO-FAST AIR PLIER

Lightweight — Easily Portable

OPERATES 50-110 LBS. AIR PRESSURE

No need to take the work to a big, stationary stapling machine. You can use the Duo-Fast Air Plier where it is most convenient —take it to the job.

A flick of the trigger does the stapling job. Ideal for stapling many types of cartons, making corrugated fillers, sealing heavy bags, and many other industrial stapling jobs.

And Here's the Answer to Another Stapling Problem

New DUO-FAST OC STAPLER

It Clinches the Staple Without an Anvil!

Just compress the handle. A special mechanism diverts the staple legs out and up in a clinching action. No anvil is needed. Staple does not penetrate the material.

Solves problem of fastening tags to filled cartons, making temporary closings of carton flaps, and other jobs where anvil-type stapler cannot be used. Stapler can be easily converted to an automatic tacker for other jobs.

MAIL COUPON for the story on these Duo-Fast Staplers

FASTENER CORP., 860 Fletcher St., Chicago 14

☐ Send data on DUO-FAST AIR PLIER

☐ Send data on DUO-FAST OUTWARD CLINCH STAPLER

Name_____

Company_____

Address_____

City_____ State_____

Circle No. 123 on Reader Service Card for more information

announced by U. S. Engineering Co. It can be used as a hopper to feed parts in an orientated manner for assembly or machine operations. It can also be used for packaging by providing it with mechanical release fingers for small counts or with an electronic system for larger counts. A suggested ideal application where great savings in packaging costs can be made is in the use of several machines to simultaneously feed several different items into the same container—such as two screws of one size, three screws of another size, five nuts, five washers, etc. Production rates up to 200,000 parts per hour can be had, depending, of course, upon the size and shape of the part being hoppered. Change over from one size or shape to another can be made in about five minutes. No change-over parts are required.

Circle 315 on Reader Service Card for more information

"Educational" Impact Recorder

Here is an impact recorder which can be mounted on the exterior of a freight car to help teach

ITS FELT TIP WRITES ON EVERYTHING!

in BOLD or fine lines

Marking steel drums, tools, parts, pipes, etc. is smooth sailing with the Flo-master Felt-Tip Marker.

The complete range of ten colors in Flo-master Inks permits speedy and accurate identification for assembling, stocking, inspecting.

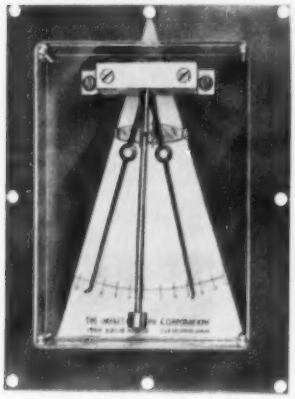
Flo-master semi-opaque inks — waterproof, non-smudging, fast-drying — are recommended for hard-to-mark surfaces using the KING SIZE Flo-master. For general purpose marking—cartons, cases, etc—use Transparent Inks with POCKET SIZE Flo-master (illustrated).

Contact your supplier or write direct to Cushman & Denison Manufacturing Co., Dept. F-20, 153 23rd St., New York 11, N.Y.

Flo-master
FELT-TIP MARKER

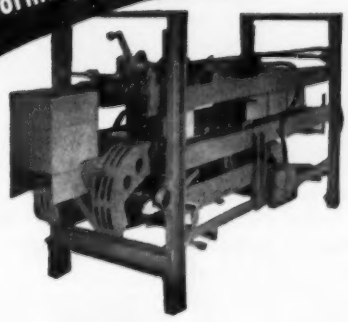
Circle No. 102 on Reader Service Card for more information

those handling cars in humping operations to be more careful. Because men moving cars are aware that the impact recorder is on a car, and because they can see results of humping as soon as they get off the car, they will soon learn to judge impact speeds with greater accuracy, according to the manufacturer, Impact - O - Graph. The recorder is also claimed to reduce damage by indicating immediately when a car has been poorly handled so that it can be opened quickly for examination of the interior. The effectiveness of interior blocking and bracing can be studied and necessary steps can be taken to avoid further damage in transit. The recorder indicates the speed of the car through a pendulum device which moves the indicating hands. It records the speed whether the shock came from A or B end of the car. Under the indicating hands is a calibration table with miles per hour marked in fluorescent paint for visibility at night. The mechanism is mounted on a fiberglass plate.



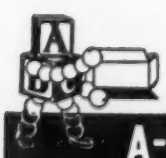
Circle 316 on Reader Service Card for more information

A shorter, narrower, simpler, and better performing case sealer



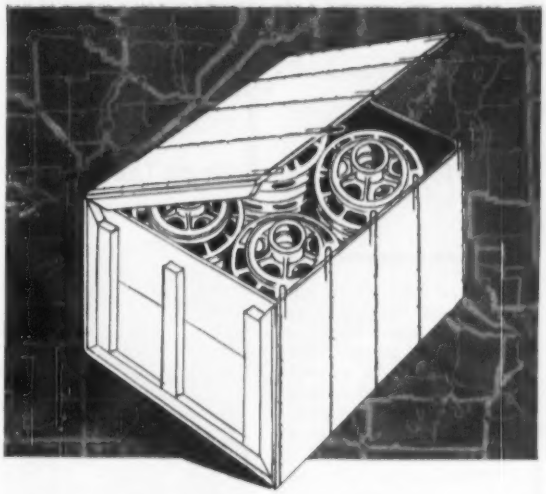
THE NEW A-B-C *Junior* CASE SEALER

The A-B-C Junior Case Sealer automatically seals corrugated shipping containers in only a fraction of the floor space ordinarily required. Operation is fast—trouble free—economical. A completely new flight chain construction virtually eliminates carton jamming . . . Three semi-automatic models are available to fit most case sizes. Write today for details and floor plans.



A-B-C PACKAGING MACHINE CORP. QUINCY, ILLINOIS

Circle No. 16 on Reader Service Card for more information



No matter where it's bound

SHIP IT WIREBOUND!

Lower Total Cost

Better Stacking

Faster Assembly

Reduced Weight

Whether you're shipping tractors to Brazil or taximeters to Buffalo you will *ship safer at lower total cost* in Wirebound Boxes or Crates. Wirebounds are the remarkable tailor-made containers that combine the strength of steel with the resiliency of wood to save tare weight. They come to you flat, take less storage space, assemble in less than a minute and consistently slash damage claims. Isn't this the shipping story *you've* been wanting to hear? Wirebound Sales Engineers will tell you the whole story of safety and savings for *your* product!

Wirebound BOXES & CRATES

MAIL THIS COUPON NOW!

WIREBOUND BOX MANUFACTURERS ASSOCIATION
Room 1171, 327 South LaSalle Street, Chicago 4, Illinois

☐ Have a sales engineer give me the whole story
☐ Send me a copy of "What to Expect from Wirebounds"

Name_____

Firm Name_____

Address_____

City, Zone and State_____

Circle No. 295 on Reader Service Card for more information

Circle No. 68 on Reader Service Card for more information

BLOCKSOM

Paratex

RE-USABLE DUNNAGE

Means Lower-Cost Shipping

Paratex dunnage cushions the most delicate instruments against vibration, shock and impact. And, when used with re-usable drums, will last through many round trips—your initial dunnage cost can be amortized over many shipments.

FREE Engineering Service

We'll design your *Paratex* rubberized curled hair shipping pads in the right density, molded to shape to meet your exact needs at no extra cost to you! (Also available in flat sheets or die-cut to fit your requirements.)

Call or write for free sample and complete information to:

BLOCKSOM & COMPANY

Main Office and Plant: Michigan City, Indiana

Cut Stenciling Costs
Eliminate Brushes and Ball Pots

Spray

Quick-Drying, Water-Proof

Stencil Ink

• Efficient, easy-to-handle aerosol dispenser eliminates the muss and waste of leaky, sticky fountain brushes and ball pots. Nothing to clean. No waste.

7 COLORS—Black, Green, Red, Yellow, White, Orange and Blue.

The proven, widely used, modern method of stenciling boxes, cartons, drums, pails, crates—ideal for color coding of materials,—inspection marking, etc.

[*Ask us also about Stencil-Kover — blocks out old stenciling — permits containers to be used again*]

REYNOLDS INK, Inc.

4508 EUCLID AVENUE, CLEVELAND 3, OHIO

Tell us more about your Stencil Ink and Stencil-Kover

☐ Send literature ☐ Ask your dealer to demonstrate

Name ..... Title .....

Company .....

Address .....

Circle No. 247 on Reader Service Card for more information

Electro-Magnetic Stapler

The Fast-N-Tite stapler, developed by Air-E-O Electronics Corp. is said to quiet, simple and effortless to operate. A variety of models is available for light or heavy-duty and single or double stapling. Long throat and custom built machines to meet special stapling requirements may also be secured. Any model may be furnished with either fingertip or foot control. For minimum maintenance, the machines are equipped with standard office staplers which are removable and interchangeable in seconds.

Circle 317 on Reader Service Card for more information

Labeler for Round Containers

A semi-automatic labeler for round containers has been announced by The Atlantic Supply Co. Outstanding features include an automatic label feed and a pivoted frame which opens for easy cleaning. It is claimed that the machine lessens to a matter of minutes the time required for changing from one size container to another. The automatic label feed reduces the operator's work to simply removing the labeled cans or bottles from the machine. Light weight, corrosion-resistant materials are used throughout, making the machine durable and easily portable.

Circle 318 on Reader Service Card for more information

Improved Reinforced Tape

A newly developed reinforced tape, called Fastweld, owes its increased pliability and ease of handling to a process called "Supple-ized" according to Hudson Pulp and Paper Corp. Fastweld is made of two 30# kraft sheets laminated with asphalt and reinforced by-directionally with Fiberglas threads. The Fiberglas reinforcement gives the tape high tensil strength and resistance to wear. An extra heavy coat of glue is said to activate Fastweld instantly and results in a deep and permanent bond with the carton surface.

Circle 319 on Reader Service Card for more information

Circle No. 297 on Reader Service Card for more information

Wiretyer

Fully Automatic Packaging Units and Conveyors Speed Your Package- and Bundle-Tying Operations

Wiretyer equipment is cutting bundle-tying material costs 60% for newspapers — cutting strapping costs 60% for shingle manufacturers. Now, with the new Wiretyer Conveyor, it is the most efficient system ever engineered for these operations. It's the fast, economical way to tie your product securely in pilfer-proof bundles and packages. Handles up to 1500 units an hour.

TYPICAL WIRETYER APPLICATIONS

BUNDLES:

Newspapers, Cans, Shook, Magazines, Asphalt Shingles, Wood Shingles, Multiwall Bags, Lath Bundles, Hardwood & Flooring.

CONTAINERS:

Export Foods, Pulp Paper, Fish-pole Antennae, Canned Goods, Electric Light Bulbs, Foodstuffs, Parcel Post (Dom. & Exp.), Bread Boxes, Clothing, Crated Fruits, Advertising Literature.

WHAT USERS SAY

QUALITY "The Wiretyer double-tie makes a better package than when done in any other manner."

DEPENDABILITY "We tie exclusively now with the Wiretyer machine."

COMPACTNESS "We are able with the compact bundle tied by Wiretyer, to store more bundles on a truck."

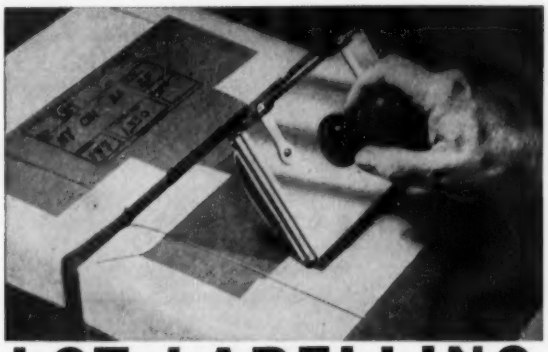
ECONOMY "The Wiretyer machine has met all of the requirements necessary to give us a neat, compact package with the utmost efficiency."

WRITE TODAY for complete details on how WIRETYER can increase production and save money in your shipping department.

WIRETYER CORPORATION

230 WARBURTON AVENUE, HAWTHORNE, NEW JERSEY

8-84-8



LOT LABELLING

Eliminate Shipping Labels! Print Direct!

Quick! Accurate! Easy! Print shipping information direct on cartons, boxes, packages. Eliminate double operation of preparing labels and then pasting them to the containers. Get 1,000 or more clear, sharp impressions from one stencil without re-inking. New FORM-CUT® Stencil has facsimile of your label or shipping form die-impressed into the stencil. Then type or write in address or identification data . . . attach to duplicator . . . and print, like using a rubber stamp. Write for Literature and FREE SAMPLE FORM-CUT STENCIL AND PRINT.

THE ORIGINAL HAND STAMP STENCIL DUPLICATOR

IT PRINTS ANYWHERE

Also for addressing shipping tags and labels . . . prints postcards, menus, forms, bulletins. 8 complete outfits: $9.50 to $99.50, including supplies (f.o.b. factory). At office or shipping room supply dealers.

OVER 30 YEARS

MULTISTAMP STENCIL DUPLICATOR

MANUFACTURED ONLY BY THE MULTISTAMP CO. NORFOLK, VIRGINIA

Circle No. 215 on Reader Service Card for more information

Why pay more?

Specify the RACK

TURNABOUT®

ADJUST-A-FORK

HYDRAULIC LIFT TRUCK

featuring Overload Safety Valve!

The low cost, high quality Turnabout will save you many dollars in your pallet handling operations. Interchangeable forks supplied in five standard lengths — 30", 36", 40", 42" and 48". Also available in 54" and 60" lengths, if desired. Capacity: 2,500 lbs.

Write for Bulletin today!

RACK **Hydraulic Equipment Corp.**

131 Sixth St., Connellsville, Pa.

Circle No. 240 on Reader Service Card for more information

the way STANLEY Magic Doors® speed materials flow for TEXTRON

What better proof that automatic opening and closing Stanley Magic Doors will improve your mill's all-round efficiency is there than this — *all* the leading textile manufacturers in the country, including Textron, Inc., have installed them in strategic locations in one or more of their plants.

the reasons may be real eye-openers:

STANLEY Magic Door CONTROLS

1. . . . reduce door and truck maintenance. Doors open automatically . . . close swiftly when traffic has passed. There's less chance for trucks to bang into doors that always open on approach!
2. . . . conserve costly conditioned air. When doors close immediately after traffic flows through, heat and humidity are saved.
3. . . . save time and energy. Productive man-hours aren't wasted when manpower is not required to open and close heavy doors.
4. . . . boost mill personnel morale. Workers are happier and more productive — they appreciate the fact that management is making their jobs easier.
5. . . . can be installed on new or existing doors that *swing, slide, or fold*. A variety of controls, ranging from the photoelectric Magic Eye (at Textron, in the picture above) and Magic Carpet, to pull cords and switches, are available.

THIS COUPON WILL BRING YOU ALL THE FACTS BY RETURN MAIL!

STANLEY® Magic Door CONTROLS

REPRESENTATIVES IN PRINCIPAL CITIES

THE STANLEY WORKS, MAGIC DOOR DIVISION
086-M Lake St., New Britain, Connecticut

☐ Please send full information on *Stanley Magic Door Controls*.
☐ Call when in area.

Company Name _____
My Name _____
Address _____
City _____ Zone _____ State _____

STANLEY TOOLS • STANLEY HARDWARE • STANLEY ELECTRIC TOOLS • STANLEY STEEL STRAPPING • STANLEY STEEL

Circle No. 265 on Reader Service Card for more information

(*Continued from page* 177)

quires a study of packaging department layout and its relationship to the entire plant. The advanced application of push-button control centers directing the flow of products along conveyor lines will launch a new era of automatic control. Finished products will flow smoothly from the assembly line to the packaging department and thence to the warehouse for storage or to the shipping area for direct movement.

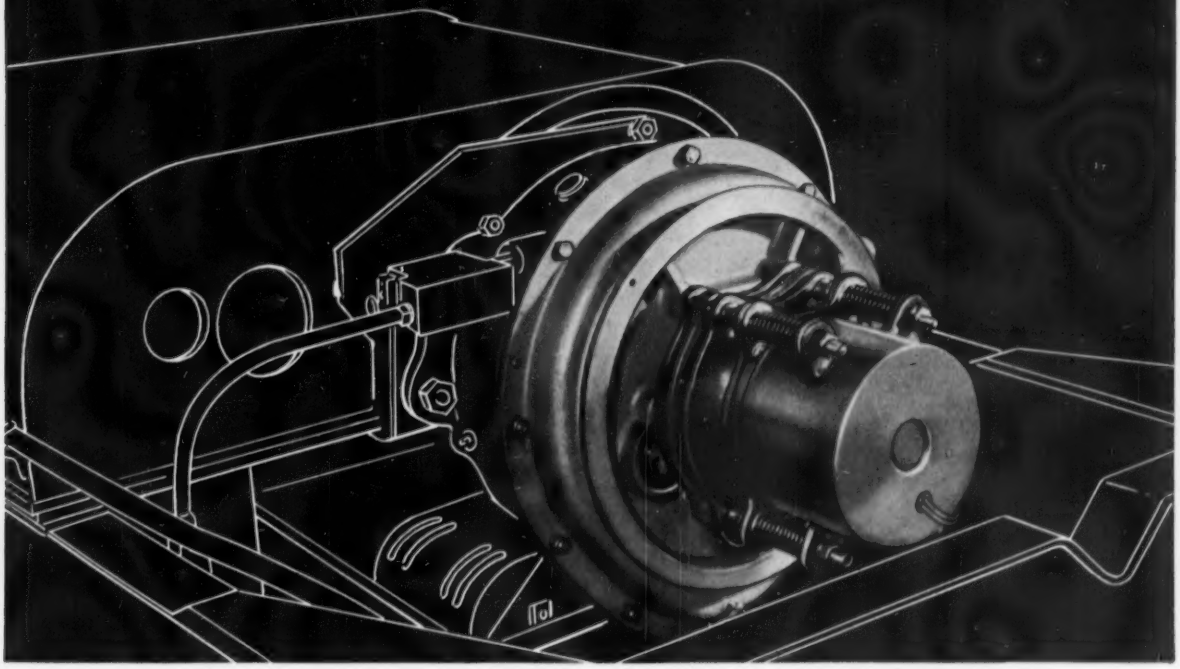
We envision manufactured products flowing smoothly from the final assembly line to the packaging department by means of powerized nylon belt conveyor equipment. Push-button operated control panels will actuate conveyor spurs leading to packaging lines. Upon completion of the packaging and packing operation, palletized loads or unit containers will receive much less individual treatment than in the present era. Conveyor networks mounted flush with the floor level will transport packed containers to designated warehouse areas or to interlinked rail and truck platforms.

Associated with the predicted advances in packaging and shipping techniques will be the evolvement of underground conveyor networks planned to transport packaged products from outlying terminals directly to the hearts of distributions points in the greater metropolitan areas. Such conveyors will always enjoy a "fair climate", untroubled by storms, traffic conjestion, or shortages of surface transportation facilities. Increases in our economic development during the next decade will place tremendous strains upon trucking, street facilities, handling methods and distribution procedures. The realization of the underground conveyor will eliminate or at least lighten these crucial problems.

Guided Missiles for Freight Transport

The rapid growth of jet and rocket-propelled guided missiles by the military, will be reflected in adoption of the principles by in-

A Real Brake for You

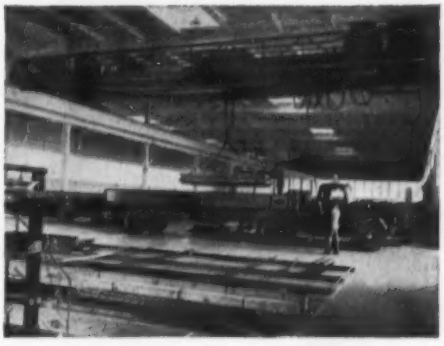


now yours on P&H Trav-Lift Cranes
Rectifier Brakes to end all AC Brake Troubles

Whichever your power, braking is always DC. Action is smooth, instantly responsive, as only 1/32" movement is required to open the brake. In the entire brake there is only *one* simple adjustment.

Ended forever are costly AC brake problems . . . the headaches you're living with right now. No flared laminations . . . No coil failures due to improper armature seal . . . No linkage troubles; there is no linkage.

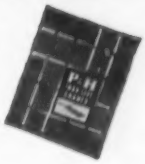
Sound good? It is good . . . and only the P&H Trav-Lift Crane offers this new rectifier brake. It's another P&H advantage . . . the result of the entire crane-building job by P&H, electrical equipment included . . . to give you what's new and better in cranes. P&H Overhead Crane Division, Harnischfeger Corporation, Milwaukee 46, Wisconsin.



HARNISCHFEGER

SEE THE TRAV-LIFT "IN YOUR OWN WORK."

New bulletin has picture sections showing Trav-Lift cranes in all services, tells about P&H Rectifier Brakes and other features. For all handling jobs up to 15 tons, floor or cage control. Ask for Bulletin C-51.



the P&H *Line*

Circle No. 1 on Reader Service Card for more information

Notice ease with which worker handles this 48" x 60" Magcoa Dockboard.

One-man, "do-it-yourself" handling equipment!

Low dock, high truck . . . requiring a long, easy slope. Magcoa solves it easily with a combination consisting of a Ramp section and a Dockboard section. And each section can be moved by one man. If it had been built as a one-piece unit, it would have been difficult. This way, it's easy . . . and safe.

On big, big ones, like this 90" x 54" Dockboard for use with double-door railroad cars, Magcoa installs retractable lift truck handles . . . however, despite the bulk, final positioning and up-ending can be done manually by one man.

Even the big Magcoa Yard Ramp for trailer and rail loading from ground level can be moved and positioned by one man. Whatever your loading problem, you can count on Magcoa to help you solve it.

What's your loading dock problem?

Your local Magcoa representative can help you solve your loading dock problems, whether "routine" or difficult. A new bulletin shows a variety of dock problems *and solutions.* It's titled, "What to do about Difficult Docks," and is available on request.

MAGNESIUM COMPANY OF AMERICA
Materials Handling Division
EAST CHICAGO 1, INDIANA
Representatives in Principal Cities

For your free copy of "What to do about it" . . . clip this coupon to your business letterhead, print your name clearly, and mail today to Magnesium Company of America, Materials Handling Division, East Chicago 1, Ind.

Circle No. 195 on Reader Service Card for more information

PACKAGES GEARED

Continued

dustry to accomplish fast transportation of inter-continental and cross-country freight. To load a rocket propelled, load-bearing device, conveyors will be mounted flush with the launching platform to transport the packaged stock to the missile's cargo hatch. Through control-tower windows, the operations will be viewed and controlled by a single operator.

SHIPPING . . .

(*Continued from page* 181)

able. (In fact, passenger operations often are money-losers.) A method combining freight and passenger hauling, without impairing speed would result in greater profits.

Designers of demountable cargo holders think they have the way. They anticipate that demountable cargo holders will make it possible to load or unload 60,000 pounds of freight as quickly as the passengers can leave and board the train at a given way-station.

Before a combination passenger-freight train arrives at a station, loaded outgoing cargo holders will be spotted at rail-side. That is virtually the only preparation required.

When the train pulls in, fork trucks first will remove incoming demountable cargo holders from flat cars, then load the outgoing units. That's all! Freight loading and unloading will be completed in an average of under 10 minutes.

2. *Demountable cargo holders in the form of tanks, bulk bins, etc. . .*

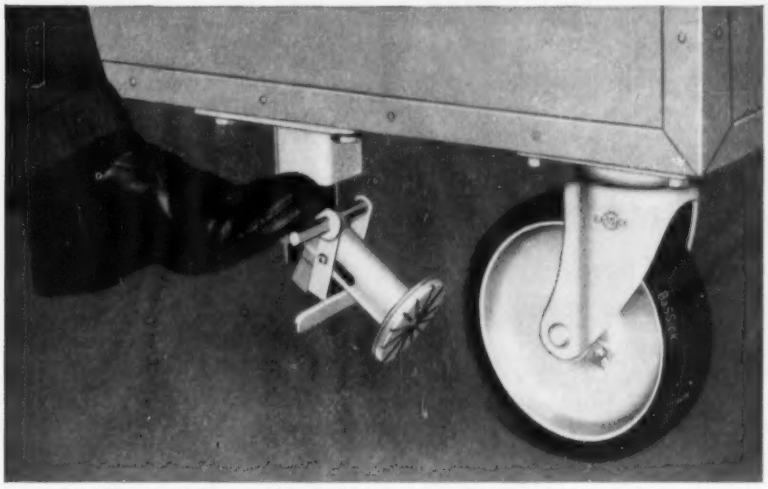
A shipper of bulk liquids, powders etc., may some day be able to put his entire output into these shipping containers for hauling via any type of transportation. Because the demountable cargo holders will be usable as dispensing units, considerable handling and transfer of contents will probably be eliminated.

(More on page 210)

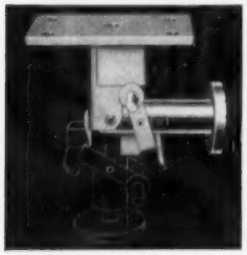
MATERIALS-HANDLING NEWS

★ Panel Discussions by Bassick, World's Largest Manufacturer of Casters and Floor Protection Equipment ★

New position lock allows 3 times as much floor clearance as old types



NEW Bassick retractable position lock is easily engaged by light foot pressure on accessible top lever arm. Pad facing is oil-resistant neoprene.



VIEW of lock in retracted and extended positions. Lock is released by easy pressure of toe on flat lever arm at left in phantom section of illustration. When retracted, position lock provides 3¼" clearance. New lock has positive locking action for safe and secure positioning of any mobile equipment.

Retracts with 3¼" clearance

Bassick's new retractable position lock makes mobile equipment *more* mobile. 3¼" ground clearance enables lock to pass over floor obstacles considered stumbling-blocks until now. This feature makes it ideal for scaffolds, floor trucks, engine stands and similar equipment.

Designed for use with 6" and 8" industrial casters, the new device locks and releases easily, positively. Retracting action is safely controlled throughout movement. Model F-620 lock (for use with 6" caster) has effective mounting height of 7⅜", Model F-820 (for 8" casters) has 9½" mounting height.

Friction facing of lock is thick, resilient neoprene which grips floor tightly but won't mar it. Drop a line for free copy of new folder form No. PL55 — it gives complete specifications.

5.33

Plant Food

DOUGLAS AIRCRAFT CO. uses Bassick "Floating-Hub" casters to prevent shock damage to liquids, foods and dishes on this food tram in the El Segundo, Calif., plant. These casters provide *true* shock absorption, are also widely used on other equipment.

Safe Handling for this Jet

U.S. NAVY PHOTO

When this Navy F9F jet fighter needs attention, her maintenance crew aboard the carrier USS Valley Forge cart her about on this dolly equipped with a Bassick position lock. Positive action of lock assures firm grip on hangar deck for maintenance work.

Lewis-Shepherd Products, Watertown, Mass., made sure their new Dragmaster Cart rolls easily by equipping it with Bassick Series H99 swivel casters. It's part of a powered in-floor dragline system that transports loaded 2-wheel hand trucks.

Get to know your distributor

The local distributor handling Bassick does more than sell you casters. His salesman covers your area thoroughly, can pass on tips for new ways to save money on materials-handling. And his facilities actually serve as your local warehouse —you invest no money in storage facilities. What's more, you get fast service on all orders — that's why he's a *Bassick* distributor.

THE BASSICK COMPANY
Bridgeport 2, Conn.
In Canada:
Belleville, Ont.

Bassick A DIVISION OF STEWART SW WARNER

MAKING MORE KINDS OF CASTERS — MAKING CASTERS DO MORE

Circle No. 62 on Reader Service Card for more information

in **YOUR** cost reduction program

START HERE

. . . then standardize on

KENNETT

vulcanized fibre "job designed" receptacles for industry

You may find your *big* answer to reducing costs and increasing plant efficiency in the way you handle the production flow in your plant.

Product handling—and the right choice of receptacles—can easily be the big difference between red ink—or black.

The Kennett Line of Receptacles for industry have much to offer in plant efficiency and cost reduction through better ways to handle products. Here's why:

They're designed to fit the job—they're strong, smooth, tough and durable, yet have a resilience that permits them to accept repeated shock without failure and safely handle the most delicate parts.

They're expertly fabricated with all-riveted construction, reinforced metal hardware and smooth plated metal molding.

They're light in weight because, ounce for ounce, National's Vulcanized Fibre is only half the weight of aluminum.

Kennett Equipment will give you many years of hard service life without replacement or maintenance.

SEE US AT CHICAGO!
Materials Handling Exposition—
May 16-20
Booth No. 1224

NEW KENNETT CATALOG

Here's your personal guide to the finest materials handling equipment ever built. Write for your free copy of catalog 54 direct to Dept. L.

FIBRE SPECIALTY DIVISION
NATIONAL VULCANIZED FIBRE CO.
WILMINGTON 99, DELAWARE
In Canada: National Fibre Company of Canada, Ltd. • Toronto 3, Ont.
VULCANIZED FIBRE • PHENOLITE LAMINATED PLASTIC • VUL-COT WASTEBASKETS • TEXTILE BOBBINS

Circle No. 133 on Reader Service Card for more information

Continued

3. *Low-cost outdoor storage . . .*

Visualize a straight-line assembly operation housed in a long, narrow building. Doorways are located along each side of the building to accommodate individual machines in the assembly line. Within the plant itself, there is no provision for warehousing. Instead, all storage is in demountable cargo holders spotted in marked-off "incoming" and "outgoing" yard areas.

When a production or assembly line machine needs stock replenishment, a full cargo holder is positioned at the appropriate doorway. Parts are fed directly into the machine. At the end of the line, finished products are placed into waiting demountable cargo holders to be removed to an outdoor finished goods storage area, or to be placed on a vehicle for shipment. The entire operation is cycled so that fork or straddle trucks working in the yard can operate on schedules attuned to production-line speed.

4. *Efficiency in water transportation . . .*

Developmental work is now being done to adapt ocean and lakes vessels for transporting demountable cargo holders on open decks. The containers will be constructed of a light-weight salt-water-resistant material; will be locked into position quickly and automatically, and will be unlocked just as quickly and easily.

5. *Closer coordination of all types of transportation . . .*

Because of the interchangeability of the cargo holders, it is claimed that it will be no trick for truckers to handle the bulk of short hauls and railroads most of the long hauls. Trucks will be used to move loads from any point of origin to any main-line terminal. The railroad will make the long-distance haul to the terminal nearest the final destination. Another trucker will take over for the short final haul. This same principal may be applied in coordinating other types of transportation.

Closer coordination of motor

carriers and railroads will undoubtedly be effected whether "standard" piggy-backing or one of the other proposed methods is used. Adoption of a proposal by Charles H. Ayres, general counsel for U. S. Truck Lines, would probably help achieve that end.

According to Ayres, two kinds of piggy-back operations are practiced today:

(1) Rail service movement of freight which is listed on railroad bills of lading and which is 100% under the supervision and responsibility of a railroad. Motor carrier service is arranged for by the railroad.

(2) Substituted rail for motor service. In this method, the motor carrier has full responsibility and arranges for whatever railroad service is necessary.

Ayres proposes that railroads and motor carriers establish joint through rates like those already established within railroad and trucking industries. He agrees that there is nothing wrong with either of the above methods, *within the limits of traffic that can benefit by them*. The trouble is that a given carrier can provide through piggy-back service only between terminal points which it serves.

A case in point is provided by a firm located in Lubbock, Texas. To ship freight to a customer in Akron, 1500 miles away, the firm uses straight motor carrier service, and it gets fifth-day service. Ayres claims that, with all other factors being equal, hauls of this length could be handled more efficiently by railroads.

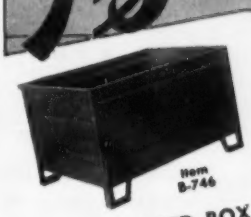
Because no single carrier serves both Lubbock and Akron, Ohio, piggy-back service is not available to this manufacturer. If it were, shipments would travel in the following manner:

> Motor Freight from Lubbock to Dallas . . . Rail transportation from Dallas to Columbus, Ohio . . . Motor carrier from Columbus to Akron.

This would be at least as fast as the present over-the-road method and would be accomplished at far lower operating cost.

FLOW'S thanks to the following for information used in the preceding article: Clark Equipment Co.; Emery Air Freight Co.; New York, New Haven and Hartford Railroad.

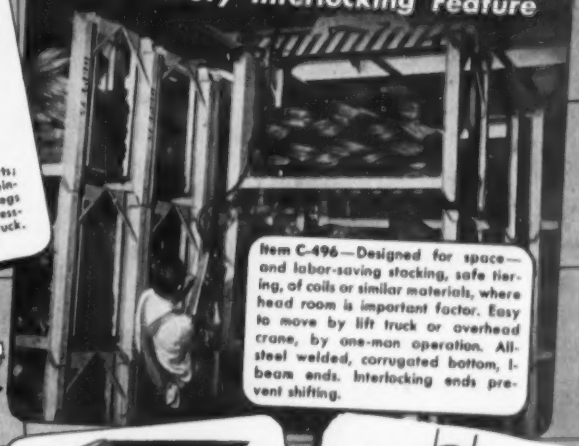
CONSULT P-S FOR THE BEST Materials HANDLING EQUIPMENT



CORRUGATED BOX with Legs

For moving or storing heavy metal parts; built of heavy corrugated steel; reinforced throughout with angle iron. Legs are designed to permit complete accessability with fork or power lift truck. Made in any size or load capacity.

STACKING RACK with Safety Interlocking Feature



Item C-496—Designed for space- and labor-saving stocking, safe tiering, of coils or similar materials, where head room is important factor. Easy to move by lift truck or overhead crane, by one-man operation. All-steel welded, corrugated bottom, I-beam ends. Interlocking ends prevent shifting.

Item B-827 Corrugated STEEL PLATFORM

Item B-744 Heavy Duty DIE TRUCK

Item B-426 $67.20 STOCK CHECKER'S TRUCK

Designed to handle a large variety of items or parts. Three steel shelves with 1" flanges all around. Floor clearance 9½". Overall height to top shelf 42½"; top of table 50". 44" long, 20" wide. All steel welded construction. Semi-crated approx. 190 lbs.

Item No. NS-298 $51.15 Hand DUMP TRUCK

Catch turnings from screw machines, ideal for holding scrap, etc. Water tight.
Top 25¾" x 45", bottom 23¾" x 27". Depth is 17½". Height 23". Furnished higher or lower on special order. Carries about ½ cubic yard. Two 8" semi-steel wheels and two 4" metal swivel casters. Weighs app. 125 lbs.

Item C-1258 $46.50 Vertical DRUM LIFTER

For handling open and closed steel drums in vertical position, by crane or hoist. All-steel welded construction. Sure-hold safety barrel grip. Saves plant space. Use for either high or low ceiling condition.

Portable Heavy Duty BAR RACKS

Item C-497—Handling and storage of steel shapes simplified for one-man operation. Using overhead crane for storage in tiers, rack selection is no problem. Design permits bar selection from any rack without disturbing tiers. Quick—convenient—safe—efficient storage for maximum man-hour savings. Built to any capacity and length of stock.

Item B-509 All metal PALLET

Item NS-949 BOOK RACK

Industrial DUST PAN Item S-703

Item C-928 Square STACKING BOX

Item S-915 CORE RACK

Item B-498 CARBOY TRUCK

Item C-669 SKIP TOTE BOX

SHOVEL TRUCK Item S-899-M

UTILITIES RACK on wheels

Item NS-415M $81.20 (Roller bearing, 6" x 2", all-metal wheels.

Item NS-415R $85.25 (Ball bearing, 8" x 1½", rubber-tired wheels).

WHEN ORDERING—Always give "item" number. All prices are f. o. b. Detroit. Prices are subject to change without notice.

DESIGNED AND MANUFACTURED BY Palmer-Shile Co.

16012 FULLERTON AVE., DETROIT 27, MICH.

580 FIFTH AVE., NEW YORK 36, N. Y. Plaza 7-6774 612 N. MICHIGAN AVE., CHICAGO 11, ILL. Michigan 2-7607
6801 EUCLID AVE., CLEVELAND 3, OHIO. Henderson 2-1900 935 N. CAPITAL AVE., INDIANAPOLIS, IND. Melrose 8-2557

Circle No. 87 on Reader Service Card

in useful literature

These publications, written by experts, are available. Indicate your choice on the self-mailing Readers Service Card.

Dragline Conveyors:

Trukveyors, a dragline conveying medium designed to reduce the unit cost of material handling in warehouse, truck and railroad terminals, are described in a 24-page booklet available from Link-Belt Company.

Circle 320 on Reader Service Card

Rubber Wheel Info:

A brochure on industrial wheels is available from Bronco Products Company. It contains illustrations of each type of Bronco wheel, plus descriptive literature explaining the variety of rubber treads.

Circle 321 on Reader Service Card

On Cutting Sweeping Costs:

A colorful brochure has been prepared by Wilshire Power Sweeper Company covering various types of industrial sweepers. Use of the units is said to cut sweeping costs by as much as 80 percent.

Circle 322 on Reader Service Card

Battery Bulletin:

Two specification bulletins have been released by C&D Batteries, Inc., covering the company's complete line of lead-calcium and lead-antimony batteries for control, switch-gear and auxiliary power application.

Circle 323 on Reader Service Card

Electric Weighing:

Crane scales for electrically weighing by SR-4 load cells are presented by Baldwin-Lima-Hamilton Corporation in a 12-page illustrated bulletin.

Circle 324 on Reader Service Card

Box Car Unloader:

A crane with a unique boom action which will reach into all areas of a box car, pick up and retract the load, is detailed in a drawing available from Silent Hoist & Crane Co.

Circle 325 on Reader Service Card

Caster and Wheel Catalog:

The Colson Corporation has available a 20-page catalog covering its complete line of industrial casters and wheels. Instructions on how to select the proper type and capacity wheel and caster are included in the literature.

Circle 326 on Reader Service Card

For Small Parts:

Chas. Wm. Doepke Mfg. Co., has published an eight-page catalog covering all products in the NesTier line of small parts handling equipment.

Circle 327 on Reader Service Card

Rack Benefits:

A new idea in controlled motion is presented by The Rapids-Standard Co., Inc. in a colorful catalog. Called the Flow Rack System, the method of storage is described in detail, together with benefits resulting from its use.

Circle 328 on Reader Service Card

Versatile Yard Truck:

A brochure prepared by the Truckman Division of the Knickerbocker Company tells about a truck which is versatile enough to handle practically any job in the yard.

Circle 329 on Reader Service Card

LP-Gas Advantages:

Advantages of using liquified petroleum gas power for industrial fork trucks are pointed out in a four-page brochure available from Clark Equipment Company.

Circle 330 on Reader Service Card

Hydraulic Truck Bodies:

A four-page illustrated bulletin is available from The Heil Company covering the manufacturer's entire line of equipment. Subjects discussed include dump bodies and twin arm hoists, telescopic hoists, and hydraulic elevating truck tailgates.

Circle 331 on Reader Service Card

Reversible Dock Bumpers:

Specifications and construction details of reversible, rubber-coated fabric dock bumpers which are said to give double service are included in a brochure available from Bumpers, Inc.

Circle 332 on Reader Service Card

Greater Efficiency in Aisles:

Features, specifications and dimensions of the Yale Warehouser electric truck with Extend-A-Forks are outlined in a bulletin released by The Yale & Towne Manufacturing Company. The truck was designed to provide greater aisle operating efficiency through forks which extend beyond the outrigger wheels to pick up and deposit loads, with no straddling of the load.

Circle 333 on Reader Service Card

Industrial Hose Data:

A 24-page catalog of industrial hose assemblies, couplings, stems, swivels and accessories has been released by J. N. Fauver Company, Inc. It contains complete description and specifications, along with engineering data.

Circle 334 on Reader Service Card

Wheels and Progress:

Nutting Truck and Caster Company has released a brochure titled "About Wheels and Progress". The 20-page publication gives a brief history of the company and tells the story of the development of its equipment from 1891 to the present day.

Circle 335 on Reader Service Card

New Electric Trucks Featured:

The current issue of Lewis-Shepard Products' Lever magazine features two recent additions to the manufacturer's line of electric trucks. One truck is a walkie model for pallets and skids and one is a riding type straddle stacker. Outstanding characteristics of both units are pointed out.

Circle 336 on Reader Service Card

...naturally it's

AMERICAN MONORAIL

This American MonoRail Monotractor unit, recently installed in a rug and carpet warehouse, dispatches hard to handle, big bulky loads over a wide area. Fully automatic, with finger-tip control, with a hoist capacity of 1,000 pounds, this installation is SAVING 200 MAN HOURS PER WEEK.

This is another of the many examples of American MonoRail engineering for low-cost, efficient overhead handling. Let your American MonoRail representative explain the versatility, low cost and low maintenance of American MonoRail equipment. Consultation in connection with any handling problem is available without obligation.

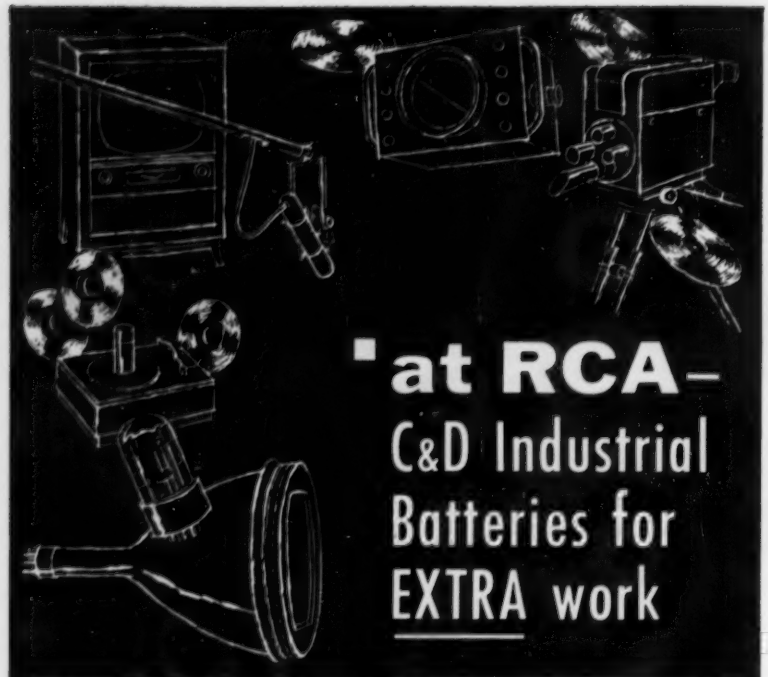
AMERICAN OVERHEAD HANDLING EQUIPMENT

MONORAIL COMPANY

13129 ATHENS AVENUE • CLEVELAND 7, OHIO

[IN CANADA—CANADIAN MONORAIL CO., LTD., GALT, ONT.]

Circle No. 37 on Reader Service Card for more information

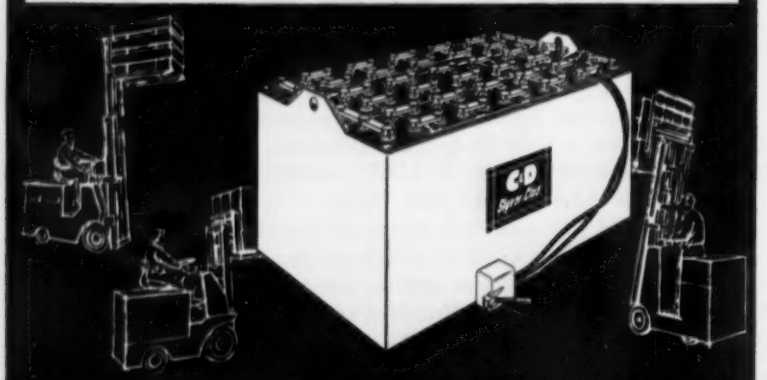


*at RCA–
C&D Industrial
Batteries for
EXTRA work

RCA, pioneer and leader in the development of the phonograph, radio and television, has brought pleasure and entertainment to countless millions all over the world. Naturally, RCA uses thousands of tons of materials of all kinds to make its famous products. To help solve its materials handling problems, RCA uses C&D Slyver-Clad* batteries as one of its major sources of power for its industrial trucks employed in daily operations. For RCA, like hundreds of other important companies, has found it pays to power with C&D Slyver-Clad batteries.

C&D Slyver-Clad batteries are approved as standard equipment by all electric truck manufacturers. For further information, write for Catalog.

*T. M. Reg.



C&D BATTERIES, INC.
of Conshohocken, Pa.
Industrial Batteries Since 1906
Sales and Service Offices in Principal Cities from Coast to Coast

Circle No. 83 on Reader Service Card for more information

Material Handling Progress Around The World:

Towmotor Corporation has prepared a factual report covering examples of efficient material handling methods employed in cities all over the world. A catalog listing is included for reference purposes.

Circle 337 on Reader Service Card

Modern Shipping:

Weber Label and Marking Systems has available a file-folder kit which shows how to modernize shipping operations. Actual product samples are included in the kit which tells how to simplify shipping paperwork.

Circle 338 on Reader Service Card

Truck Attachments:

Two new clamps, designed for handling beer kegs and drums, are pictured and described in a folder prepared by Iron Works Inc. Many general purpose clamps are also detailed in the literature.

Circle 339 on Reader Service Card

For Postal Shipments:

There's no wrapping, tying or taping, says The Mason Box Company, if you use its Mailmaster box for postal shipments. Details on how you can profit by using this container for postal shipments are included in a handy booklet.

Circle 340 on Reader Service Card

Fibreboard Container Facts:

Characteristics of fiberboard shipping containers are outlined in an eight page release published by Paisley Products Inc. The literature explains various sealing methods and pictures numerous case sealing machines.

Write 341 on Reader Service Card

Tractor Attachment:

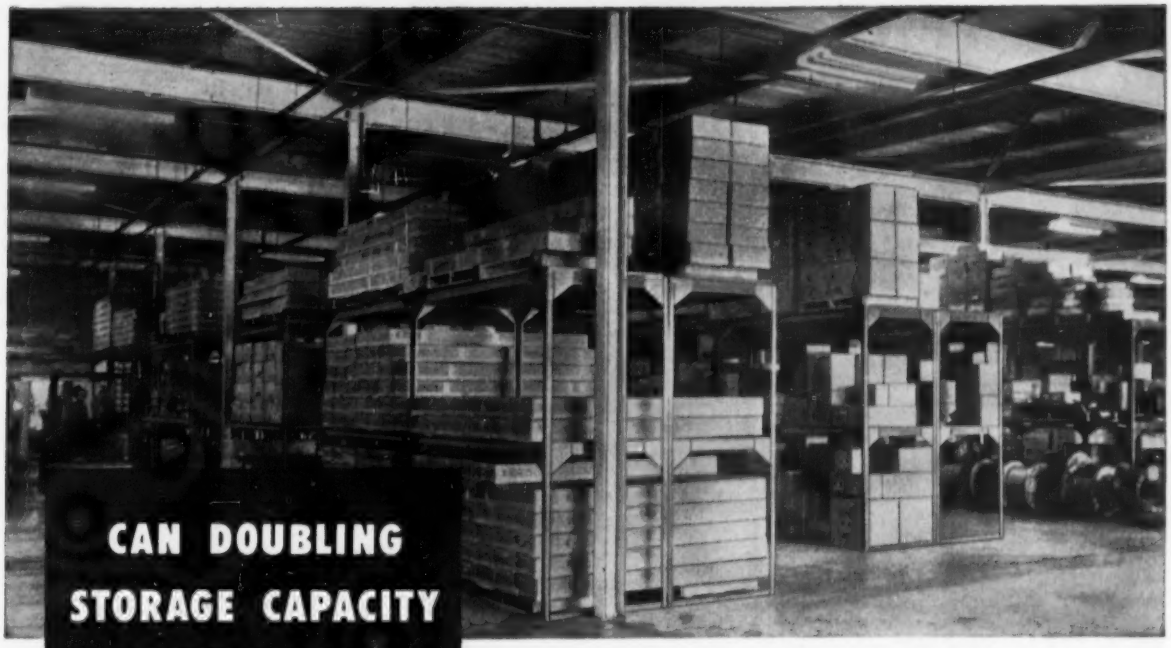
Sherman Products, Inc. is offering a booklet which describes its front end loader, designed for Fordson Major Diesel tractors. Many on-the-job illustrations and equipment uses are contained in the literature, together with special accessories, features and specifications.

Write 342 on Reader Service Card

True Timing Log:

A timing instrument which gives accurate information on engine operation is detailed in a four-page bulletin prepared by Engler Instrument Company. The instrument can be used on all kinds of equipment powered by electric motor or internal combustion engines, gasoline or diesel.

Write 343 on Reader Service Card



CAN DOUBLING STORAGE CAPACITY REDUCE COSTS FOR YOU?

NEW STORAGE TECHNIQUES GET MORE INTO LESS SPACE, CUT SERVICING TIME SHARPLY

Great advances have been made during recent years in the efficient utilization of storage space. For example, one company reports that a 652 sq. ft. area now stores material formerly occupying 1824 sq. ft.—⅔ of the space is now used for other purposes. In addition, time required for inventory, an indication of daily servicing requirements, was reduced by 1811 manhours—a saving of over 70%.

Methods of storage handling depend, of course, upon bulk of materials stored, volume, turnover, and similar factors. New storage equipment, developed to accommodate these conditions, effectively reduces storage costs. You can benefit from F-G-M long, diversified experience and know-how in this field.

WRITE TODAY FOR NEW BULLETIN "HOW TO DOUBLE YOUR WAREHOUSE CAPACITY" CONTAINING 16 PAGES OF ILLUSTRATED TIME- AND SPACE-SAVING IDEAS. FREE ON REQUEST. THE FRICK-GALLAGHER MFG. CO., 10[illegible] SO. MICHIGAN AVE., WELLSTON, OHIO.

FGM

"KNOW-HOW"
. . . increases storage capacity
. . . reduces servicing time

Circle No. 130 on Reader Service Card for more information

LAMSON ELECTRONICALLY SORTS 18 PRODUCT LINES-

AT LEVER BROS.' Hammond, Ind. *plant, a Lamson automatic sorting conveyor system operates 3 shifts per day . . . sorting 6 of 18 product lines at any one time. This system is the first of its kind . . . hung from the ceiling utilizing the air rights.*

A Single Lamson Conveyor delivers cartons of soap and soap powder from the mixed manufacturing area to the warehouse . . . a considerable distance.

The sorting devices operate from this conveyor. Each sorting device consists of an electronic identifying mechanism and the mechanical diverting equipment. The identifying mechanism, similar to a scanning device, selects each carton by a pre-printed mark. When the mark changes the intensity of reflected light, it sets-up an impulse which identifies the carton to be deflected. This impulse actuates the mechanical diverting equipment which moves the carton sidewise onto a spur feeding a pallet loader.

Lamson engineering "know-how" has not only reduced manual sorting but allows a more efficient use of floor space. Whatever the size and type of your business, a Lamson engineered system can save you material handling time and reduce your costs.

See the Big Lamson Exhibit

Featuring the NEW Install-Your-Own Conveyor System shipped to you as a complete package . . . the Lamson Air-Tube Automatic Switching System and the complete line of Lamson Sillmyre Centrifugal Blowers.

6th NAT'L MATERIAL HANDLING SHOW

Amphitheater, Chicago, Ill. May 16th-May 20th

BOOTHS 1708 & 1807

Mail this coupon today!

LAMSON 75th YEAR

Plants in Syracuse and San Francisco
Offices in Principal Cities

Lamson Corporation
2425 Lamson Street, Syracuse 1, N. Y.
Please send me additional information on the new Lamson Sorting Conveyor System.

NAME..... TITLE.....
COMPANY.....
ADDRESS.....
CITY..... ZONE..... STATE.....

Circle No. 181 on Reader Service Card for more information

Story of Framing:

Unistrut Products Company has released a 16mm. color and sound movie titled "The Sky's The Limit" which tells the story of Unistrut metal framing. Present day applications are shown, and there's a look into the future picturing the framing being used to construct an entire city.

Write 344 on Reader Service Card

Liquid Handling Equipment:

A well-illustrated, four-page bulletin published by Blackmer Pump Company describes the complete line of Blackmer rotary hand pumps. If you have a liquid material handling problem, you'll be interested.

Write 345 on Reader Service Card

Production Cards:

How to get more from punched-card methods with modern Remington Rand machines is described in a six-page illustrated catalog available from Remington Rand Inc. The machines may be used in every department—from production to final billing.

Write 346 on Reader Service Card

Railroad Equipment:

If you're at all concerned with railroads, you'll be particularly interested in seeing a catalog published by The Nolan Company. Pictures, specifications and details of Nolan equipment designed for railroad use are contained in the release.

Write 347 on Reader Service Card

Double-Duty Tape:

One tape which does the work of two is described in a four-page brochure by Permacel Tape Corporation. Many features of the tape are detailed, together with possible applications.

Write 348 on Reader Service Card

Automatic Counters:

Electrically and mechanically actuated counters for indicating, recording and automatic regulation of industrial machinery is described and illustrated in a technical reference offered by Richardson Scale Company.

Write 349 on Reader Service Card

Protective Packaging Samples:

If you'd like to see nine samples of Krinkled Kraft paper, as manufactured by Nichols Paper Products Company, there's a folder which you can obtain free of charge. Specifications are included in the literature.

Write 350 on Reader Service Card

Unitized Loading:

How use of the unitized loading method, using Thilco wrap-dri retaining papers, can work for you to reduce damage to goods in transit, is told by Thilmany Pulp & Paper Company in a facts folder. Samples of the paper and suggested methods of loading are included in the brochure.

Write 351 on Reader Service Card

Modern Lifting:

A brochure which tells about lifting the modern way is available from Globe Hoist Company. The firm manufactures oil-hydraulic and electric material handling lifts.

Write 352 on Reader Service Card

Magnesium News:

If you'd like to know the latest news in the magnesium industry, you can ask for a copy of "Magnesium", published by Brooks & Perkins Inc.

Write 353 on Reader Service Card

Time, Production and Profits:

A 24-page booklet which talks about time, production and profits has been published by Lipe-Rollway Corporation. It deals with automatic production as a tool for cutting inefficiencies.

Write 354 on Reader Service Card

Stenciling Data:

A hand book guide to the current addressing of shipments and the use and care of marking equipment is available from Marsh Stencil Machine Co.

Write 355 on Reader Service Card

Short Distance Handling:

Big Joe Manufacturing Company would like to tell you about an economical system for handling materials over a short distance. They call it "In-Between Handling", and it's detailed in a pocket-sized book.

Write 356 on Reader Service Card

Self-Cleaning Conveyors:

Carrier Conveyor Corporation gives specifications, uses and advantages of its Natural-Frequency conveyors in a colorful catalog. The vibrating, self-cleaning conveyor is said to be both practical and economical.

Write 357 on Reader Service Card

Better Crane Operation:

The Power Crane and Shovel Association has published a manual which lists 125 ways to better power shovel-crane operation. It will be sent for 15 cents.

Write 358 on Reader Service Card

REDUCE FORK TRUCK MAINTENANCE COSTS!

Up to 30% or more with

an LP Gas-operated LAMSON MOBILIFT ®

The low maintenance costs of LPG fuel . . . proven in other industries . . . can now be enjoyed by fork lift truck users.
The economical operation, long life and versatility of Mobilift is further increased by this alternate fuel system.

THESE MOBILIFT FEATURES ASSURE YOU OF TOP ECONOMY AND EFFICIENCY:

A high free lift at standard costs makes stacking easier and faster. All Mobilift trucks are easily accessible to driver position. No cramped quarters. "Every-side" visibility assures smoother, safer operation. Lev-R-Matic direction controls provide instant fingergrip operation . . . eliminate gear shifting. Mobil-Matic drive delivers power smoothly . . . adds years to the life of engine, transmission and drive axle. All engine parts are within easy reach.

See the Big Mobilift Exhibit

Featuring the exclusive Hydra-Lizer . . . Mobil-Matic Drive . . . Lev-R-Matic Controls . . . both "sit down" and "stand up and control" trucks. All these and many more at the

6th NAT'L MATERIAL HANDLING SHOW
Amphitheater, Chicago, Ill. May 16th-May 20th
BOOTHS 1708 & 1807

MAIL THIS COUPON TODAY

LAMSON
MOBILIFT
MOBILIFT CORP.
Home Office
Portland, Ore.
Offices in principal cities

Lamson Mobilift Corporation
5005 Lamson Street, Syracuse 1, N. Y.
Please send me complete information on _____ Mobilift "sit-down" trucks _____ on Mobilift "stand-up" trucks, on _____ all Mobilift trucks.
NAME _____ TITLE _____
COMPANY _____
ADDRESS _____
CITY _____ ZONE _____ STATE _____

Circle No. 182 on Reader Service Card for more information

There's an easy way to raise profits for you in this picture!

Rapistan "Packaged" Power Conveyors cost Less . . . do more jobs

Rapistan power belt conveyors are standard units. They are interchangeable. Put them to work in different jobs anytime. They see more use, don't stand idle in a back room. When necessary, you can lengthen or shorten a Rapistan belt conveyor to suit new needs. That's making the most of an investment. Rapistan belt conveyors are safe investments, too, with pop-out rollers, guard rails, chain guards, gap plates and other features for worker protection. Put Rapistan belt conveyor together with Rapistan gravity conveyor, and you have a "controlled flow" system. That's economy!

ASK ABOUT BUILDING YOUR OWN SYSTEM with Rapistan "packaged" conveyor units. We'll send you literature showing how conveyors pay for themselves.

FREE ENGINEERING SERVICE is as close as your phone. Rapistan Sales-Service Agencies are located in major cities, ready to serve you. Distributors in most foreign countries.

Rapistan®

POWER CONVEYOR

The RAPIDS-STANDARD CO., Inc.

457 Rapistan Bldg. Grand Rapids 2, Mich.

Circle No. 243 on Reader Service Card for more information

Industrial Truck Applications:

Case histories which tell how many prominent companies are using straddle carriers and fork trucks effectively are contained in a 24-page release prepared by Clark Equipment Company. Many types of industries are covered in the booklet.

Write 359 on Reader Service Card

Easy Counting:

Numerical breakdowns of parts, portions, products or anything countable can be obtained on the Vary-Tally unit of Veeder-Root Incorporated, according to a recent brochure on the subject. Special features of the counting machine are described, together with possible applications.

Write 360 on Reader Service Card

Easy Brick Loading:

Unitized loads of fire brick are shown being loaded by a Kwik-Mix Moto-Bug in a release from the Koehring Company. Also included in the brochure are on-the-job pictures of Koehring equipment at work.

Write 361 on Reader Service Card

Heavy Duty Cranes:

A catalog just off the press by American Hoist and Derrick Company describes American 25-ton truck and cruiser cranes. Concise, factual descriptions give a complete picture of the mobile heavy duty machines.

Write 362 on Reader Service Card

"Mechanical Hands":

How "mechanical hands", more commonly known as attachments, are working in conjunction with Hyster trucks to make easy handling of odd, bulky shapes, is described by the Hyster Company in an informative bulletin.

Write 363 on Reader Service Card

New Depreciation Methods:

Contractors will be especially interested in a booklet prepared by The Jaeger Machine Company covering new depreciation methods for contractors. Numerous helpful facts are contained in the literature.

Write 364 on Reader Service Card

Variety of Hoists:

Manning, Maxwell & Moore, Inc. has prepared a condensed catalog covering standardized hoists. Small and large hoists are covered in the booklet which lists specifications and outstanding features of many models.

Write 365 on Reader Service Card

Pneumatic Conveyor Applications:

Detailed drawings of pneumatic conveyors handling a variety of materials are presented in a 12-page catalog available from Convair. Three types of conveyor systems are described—vacuum, vacuum pressure and pressure.

Write 366 on Reader Service Card

Package Merchandising Book:

Contained in Little Packaging Library No. 3 is information on merchandising with corrugated boxes. The literature is available from Hinde & Dauch Paper Company.

Write 367 on Reader Service Card

About Battery Construction:

Industrial batteries for control, switchgear and auxiliary power are described in literature available from C&D Batteries, Inc. Outstanding characteristics of PlastiCal (lead-calcuim) batteries are listed, together with construction details.

Write 368 on Reader Service Card

Moving Sidewalk Details:

Details and pictures of Houston's moving sidewalk are presented in the latest issue of Link-Belt News, published by Link-Belt Company. The conveyor sidewalk links the parking area with the Coliseum.

Write 369 on Reader Service Card

Reduce Damage:

Gerrard Steel Strapping Division says the models TI, N and LK round steel strapping machines are economical, eliminate pilferage and reduce damage. Details on the machines are given in a colorful brochure.

Write 370 on Reader Service Card

Tape Tabs:

Sample tabs of tape are contained in a catalog sheet available from Polyken Products, Department of The Kendall Company. If you have a taping problem, you can find out what tape is best suited for your particular needs by consulting the handy chart.

Write 371 on Reader Service Card

New D-C Motor:

Illustrated in a 12-page bulletin available from Reliance Electric & Engineering Co. is the Super T line of d-c motors with Dynamic Response. Details are given on the principle of dynamic response, said to be the first completely new design d-c motor in 40 years.

Write 372 on Reader Service Card

There's a new way to cut costs for you in this picture!

New Rapistan FLOW RACK speeds order selection, adds storage space

Deep-storage FLOW RACK eliminates the need for many aisles in storage areas. This gravity conveyor racking system cuts down costly delays, provides fingertip access to inventory, speeds up order selection and turns "dead" aisle space into usable storage depth. FLOW RACK relieves employees of physical lift-and-lug, increases their per-hour value, and cuts overtime costs. FLOW RACK can be installed in a matter of hours by your own crew, without welding. It can be removed and reinstalled in another location, and can be extended either in depth or width at any time. FLOW RACK is available in standardized units for handling products of any size, weight or type . . . flat cartons, mattresses, bottled goods, small parts, foods and many others!

OUR FREE BOOKLET "FLOW RACK" contains many new money saving, time saving ideas for using FLOW RACK in production, storage, shipping, receiving and inventory operations in many industries. Write today.

Rapistan® FLOW RACK

The RAPIDS-STANDARD CO., Inc.

457 Rapistan Bldg., Grand Rapids 2, Michigan

THERE'S A RAPISTAN SALES-SERVICE AGENCY near you, with factory-trained experts ready to serve you with experienced know-how. Distributors in most foreign countries, too.

Circle No. 244 on Reader Service Card for more information

Conveyor Profit-Makers:

Catalog published by Prab Conveyors, Inc. points out the advantages of Prab's design, and gives data on the Magnavator, Tube-Veyor and Chip-A-Way units, said to be profit-makers for industry.

Write 373 on Reader Service Card

New Labeler:

A semi-automatic labeling machine for round containers is described in a pamphlet by The Atlantic Supply Company. The unit is said to speed up production and save labels, labor and money.

Write 374 on Reader Service Card

Elevator News:

News from the elevator field is presented by Otis Elevator Company in a bulletin available to you. The booklet tells about elevators on ships, in department stores and in a television studio.

Write 375 on Reader Service Card

Speeds Construction Work:

How the first and largest manufacturer of power saws uses Wisconsin engines to speed concrete construction and repair work, is told in the latest issue of Enginews, publication of Wisconsin Motor Corporation.

Write 376 on Reader Service Card

Financing Facts:

C.I.T. Corporation has literature available on a new method of machinery financing, with installment terms keyed to new depreciation schedules. A brochure of facts is available.

Write 377 on Reader Service Card

New Type Flexible Line:

Flexible nylon pressure tubing is described in a bulletin issued by The Polymer Corporation. Outlined uses of the tubing, called Nylaflow, include air-, process-, coolant-, fuel-, oil-, lubricant- and hydraulic-lines.

Write 378 on Reader Service Card

Conveyor Belting:

Imperial Belting Company is off the press with a folder which gives a capsule description of construction and types of treated stitched canvas belting for all conveying and elevating applications. The bulletin also describes the manufacturer's engineering and research facilities.

Write 379 on Reader Service Card

Protects Products:

Catalog released by Jet-Pak Inc. highlights the varied economical applications of Jet-Pak cushioned pads and blankets where shock, abrasion, marring, freezing or dust presents a shipping or warehouse problem.

Write 380 on Reader Service Card

Jib Cranes:

Abell-Howe Company says it has a standard model jib crane for most every special application. Eight of the more popular types are pictured in a catalog recently released, and the usual application of each is described.

Write 381 on Reader Service Card

How To Handle and Store:

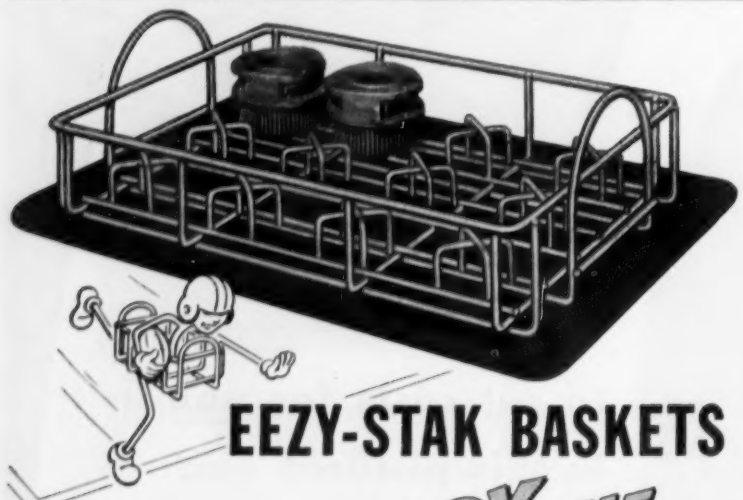
A comprehensive 20 page booklet published by Stackbin Corporation explains the Stackbin System for handling and storage of parts and materials, how it works and how it saves. The complete line of equipment is illustrated and described in detail.

Write 382 on Reader Service Card

Power Transmission Catalogs:

The American Pulley Company has issued four catalogs covering its line of V-belt drives, speed-reduction drives, flat-belt drives and steel conveyor pulleys. Each is fully illustrated and contains selection and dimensional information as well as engineering data.

Write 383 on Reader Service Card



EEZY-STAK BASKETS

CARRY THE BALL!

STANDARD EEZY-STAK BASKETS FIT THE REQUIREMENTS OF MOST PARTS-HANDLING JOBS. OVERALL DIMENSIONS: 21½" × 13⅜" × 6". AVAILABLE IN EITHER ¼" OR ½" MESH.

* Pat. No. 2646186

FOR BETTER PARTS HANDLING, CARRYING, AND STORAGE

WIPCO designs and manufactures baskets for handling everything from cigarette lighters to automatic transmissions! Both stacking (Eezy-Stak) and non-stacking baskets are *Custom-Designed* by WIPCO to your specifications. Eezy-Staks are of all-welded construction with extra frame-reinforcements, and feature the exclusive Interlock Handle* which permits easy and safe stacking.

WIPCO *Custom-Designed* non-stacking baskets are perfect for dipping, pickling, conveying, draining, storage, and numerous other parts-handling operations. They can be built with galvanized or stainless steel, copper, bronze, aluminum, or any other metal, or easily coated with rubber or plastic. Tell us *your* parts-handling problem. Let a WIPCO engineer find the *right* solution! Write today for Bulletin No. B-54.

IF YOUR GOAL IS BETTER PARTS-HANDLING, INSIST ON WIPCO BASKETS

WIPCO

WIRE AND IRON PRODUCTS, INC.

1720 Sixteenth St. • Detroit 16, Michigan

Baskets of all types for

MACHINING • WASHING • DRYING • PLATING • ASSEMBLY • STORAGE

Circle No. 294 on Reader Service Card for more information

BULK COMMODITIES . . .

(*Continued from page* 127)

It is quite possible that, as the bulk raw sugar development continues, some ships will be equipped or built with self discharging equipment similar to that of ore ships and colliers.

As for the storage and movement of refined sugar—here again we are in the midst of an evolution which has been rapidly gathering momentum. This development is probably of greatest interest to the industrial consumer.

Equipment Varies

Equipment in use for bulk refined sugar operations includes sugar silo; various forms of special rail cars; hopper and tank highway trucks; portable bins of several types in metal, rubber and wood; and tank cars and tank trucks, for liquid sugar. The consumer now has the opportunity to select from a variety of means the system most economical for his requirements.

Savings realized in bulk handling versus bag handling include, generally, about 20 cents per 100 pounds. In addition, there are in-plant handling cost reductions of anywhere from 10 to 60 cents per 100 pounds. A bulk sugar operation is more sanitary; there is less loss from spillage and pilferage; less storage space is required; and inventories can frequently be carried at lower levels. Many lesser advantages include improved employee morale and reduction in accidents.

Liquid Sugar

For the consumer who finds it compatible with his product and process, liquid sugar offers peculiar advantages. While there are numerous standard types, the customer will often be able to obtain a "tailor-made" product to suit his needs. With liquid sugar, practically no labor is involved in handling; storage space is reduced to a minimum, frequently utilizing otherwise unusable space; utmost sanitary conditions can be attained; and, if necessary, an uninterrupted process stream can be readily maintained.

Although the trend is strong toward bulk movement, there will always be an important volume of sugar products moved in bags and other small packages. (Household consumption currently represents about 50 percent of the total.)

Because packaged sugar products will remain a significant part of the industry's output, some improvements in material handling methods for these can be expected. Such improvements will most likely follow trends in parallel industries.

Machine palletizing of packages, boxes and bags will be extended. With the growth of unit-load handling methods, there will be even more interest in disposable (one-way) pallets and palletless handling, with minimum rehandling of individual packages.

Better Future

We can look forward to greater smoothness, efficiency and improved costs in the complete chain of sugar supply and distribution from field to ultimate consumer.

Incoming Inspection
Production Control
Accounting
Final Inspection
Warehouse
This 'Instan-Form' message will appear in selected departments or plants, near or far, as it is being written!

Materials Handling Problems . . . Solved with *Instan-Form*®
COMMUNICATION SYSTEMS

Here's how you can expedite materials handling, cut costs, and save time, labor and personnel. Install TelAutograph®, the only communication system that *instantly* and *simultaneously* transmits handwritten messages to one or more departments or buildings, near or far.

With TelAutograph, there's never any time wasted tracing "lost" material. Each department—Incoming Inspection, Production Control, Accounting, Final Inspection, Warehouses, etc. – has up-to-the-minute, accurate information. Data is relayed and received on *'Instan-Forms'*, individually-designed business forms that fit accounting and control procedures.

Advantages of a TelAutograph Communication System:

- Transmits accurate information of incoming material promptly and accurately
- Coordinates production planning and job assignments
- Eliminates all oral misunderstandings, copying errors
- Reduces phone calls, time-consuming personal contact
- Establishes a permanent record

TelAutograph Systems are also used to improve: Production Control, Centralized Accounting, Materials Control, Centralized Filing, Quality Control, Sales Orders, Transportation Control, and Message Services. Why not investigate the many advantages of a TelAutograph System for your company? For free descriptive literature, write Dept. F-55.

Be sure to visit the TelAutograph Booth, #1127, at the 6th National Materials Handling Exposition, International Amphitheatre, Chicago, May 16-20. See you there!

TelAutograph
CORPORATION
16 West 61st St. • New York 23, N. Y.

Circle No. 274 on Reader Service Card for more information

TON-MILE COST . . .

(*Continued from page 129*)

loads only will be supplied to it.

Unit loads of materials may be quickly removed from over-the-road trucks and placed for receiving and inspection operations by industrial truck. The unit loads would then be placed either on the slat conveyors, for movement to the warehouse and use space of the lower floor, or on the elevators or escalators for movement to the mezzanine or second floor.

Loads would be removed from the slat conveyor by industrial trucks servicing the warehouse and use locations. Empty containers would be placed on the other slat conveyors for return to the starting point.

Hoppers Fed From Mezzanine

Escalators or elevators to the mezzanine should feed extension slat conveyors running the length of the building or storage space. Overhead storage space should be so arranged that it covers all of the first floor areas wherever materials are to be used. Unit loads carried by elevating conveyors could be moved the relatively short distances by low-cost hand or driver operated power trucks.

Materials stored in the elevated space should be delivered to the lower floor by gravity as much as possible. For instance there will be chutes for feeding small hardware to hoppers at use points on the lower floor.

Packed items could be fed to these points by vertical conveyors or chutes. All empty containers should be returned to the elevated space and broken down or assembled into compact units for movement via the slat conveyor, to shipping or disposal area at the shipping end of the building.

Relatively few material handlers and truck operators would be required to service this elevated area, and the materials would be constantly available without the confusion of material movement on the first floor. This system will also minimize needs for aisle space on the first floor.

Shipping Design Duplicates Receiving

Shipping operations should be located at the side of the plant opposite receiving—to obtain straight flow of the end product. This area will have sufficient truck placement slots for shipments by highway carriers. Slots should be duplicates of those at the receiving end of the plant. The tracks running through the building can, of course, be used for shipping via rail.

Railroad cars used by this plant will be specially equipped, permanently if possible, to secure the items or loads. They will also be provided with loading or unloading devices to permit maximum economy in receiving and shipping operations.

The packaging or unitizing department in the shipping area should make every effort to make use of expendable containers, pallets, etc., received—even to the point of having a special fabricating department to convert these items for use. Specifications for containers and unit loads of in-

LEWIS

INDUSTRIAL CONTAINERS

STACKING BOX

Lewis Containers are stronger . . . last longer, and offer greater product protection, easier handling and stepped-up material flow. There is a Lewis Container to fit every need.

PLEXTON (Fiber Glass) TOTE PANS

Stack-n-Nest*

Here's strength, durability, and light weight molded into a tote pan that will mean greater pay loads and ease of handling in your plant. Impervious to oil, water, and most chemicals . . . can "take it" year in, year out.

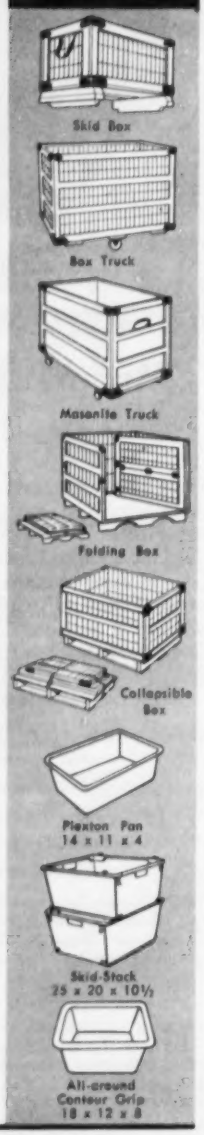
*Patent Applied For

See the new Lewis rivetless fiber container at the Show.

G. B. LEWIS COMPANY

6057 Montgomery Street • Watertown, Wisconsin

At the MATERIAL HANDLING Show BOOTH 1506



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bound materials should, as much as possible, be planned so that a large percentage may be re-used for shipping. There are two reasons for this: (1) to reduce the cost of packaging and untizing materials, and (2) to reduce the cost of disposal—which is sometimes entirely overlooked.

AUTOMATIC CRANES . . .

(*Continued from page* 121)

crane will handle, and this can be accomplished readily by incorporating overload limiting devices in the load-responsive control.

At present, very little has been done to warn a crane operator when the crane is approaching another crane on the same runway, or an obstruction. The few mechanical devices developed to do this have not proved too successful. The future crane will be equipped with an electronic proximity-indicating device which will automatically stop the crane as it comes within a pre-determined distance of an obstruction.

The higher crane speeds will demand the use of double limit stops which will reduce the crane speed by about one-fifth as it approaches its stopping point, and bring it to a complete stop when this point is reached. These limiting devices can be frequency-controlled by the automatic computer. On bridge and trolley motions, an eddy current brake coupled to the motor will provide positive deceleration when energized by the first limit stop. The crane will be brought to a complete stop by a hydraulic shoe-type brake applied by a solenoid valve.

Finally, the overhead crane of the future will be considered as a part of the production process, and will be amortized over the expected life of that process. When the process is changed, the crane will either be rebuilt to conform specifically to the new production process or will be replaced. The great savings resulting from semi-automatic operation and specific design will justify this additional expense.

Center Fold-Out Available

REPRINTS of the color fold-out constituting the center spread of this issue of FLOW are available in flat form —suitable for framing—at nominal cost of 30 cents each to cover handling and mailing. Only that side of the fold-out featuring machinery of the future, as conceived by two renowned industrial designers, will be reprinted; there will be no advertising on either side. Supply is limited, and orders will be filled on a first-come-first-served basis.

"AUTOETTE solved the passenger service problem at Los Angeles Airways"

. . . according to Mr. Clarence Belinn, President, Los Angeles Airways.

PROBLEM: To provide economical passenger movement from arriving heliocopters to distant points at the Los Angeles International Airport.

SOLUTION: Versatile Autoette 8-passenger electric buses meet incoming flights, carry passengers and luggage dependably, efficiently, economically. Mr. Belinn says: "Now we have on-the-spot, time-saving service that is more efficient than we had ever hoped for"

Autoettes are electrically powered, easy to service, recharged overnight. Rugged, no complicated parts.

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OBSTRUCTIONS . . .

(Continued from page 124)

plastic dome covers much of the central portion of the general office. The soft light filtering through the double-walled orange peel shaped segments of the dome is so well diffused that no perceptible shadows exist.

Adjacent office areas and private offices are provided with artificial lighting from low intensity glow panels forming an integral part of the ceiling. Air conditioning is a split system composed of heating or cooling panels strategically located in floors, walls, and ceilings, and supplemented by the introduction of low velocity conditioned fresh air. Being a lovely day in May outside as well as inside, we are directed to the manager's private patio adjacent to his office. Here, relaxing, is the manager meditating on the problems of the day. His current problem is expansion but it is not a serious one since once the required area and the best location in respect to present operations is determined, the major building components can be acquired from stock. Though somewhat less area than a full unit is required, nevertheless a full one will be built in order to accommodate next year's growth and to utilize standard load centers and air conditioning units.

Prefabricated Walls

The building columns will be supported on the basement floor slab which is, in effect, an invented flat slab design. This slab and the machine foundations are the only parts of the structure poured in place. Exterior foundation walls are prefabricated in large sections and trucked to the site complete with built-in waterproofing. Walls above grade are also factory-assembled complete in all respects including insulation, doors, windows and hardware. These units may be ten feet high and twenty to thirty feet long. All edges are accurately machined so that no filler strip of any kind is required for field assembly. Post-tensioned rods threaded through both horizontal and vertical cavities in the walls keep the joints permanently tight and give walls continuity.

Designed for Change

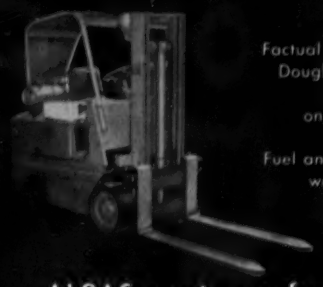
Floor and roof slabs consist of an integral union of steel joists with a concrete deck. The steel forms the bottom chord, taking the tension, while the concrete slab forms the top chord which takes compression. These units, some thirty feet long by several feet wide, are also factory-assembled and shipped to the job where they are tied together with steel tension rods. The building frame is structural steel utilizing cantilever trusses over the columns supporting simple span trusses for the middle half of the span. The entire design anticipates change.

At the manager's suggestion, we descend to the basement level to continue our tour from the start of the manufacturing operation. The lower level is the transportation hub of the plant. All raw material received both by rail and truck is discharged and stored at this level, directly below the operation in

engine hour costs cut more than 50%

on internal transportation equipment

AT DOUGLAS AIRCRAFT



Factual figures taken from a test conducted by Douglas Aircraft Company at Santa Monica, California, show that engine hour costs on both industrial tugs and fork-lift trucks have been slashed more than 50%. Fuel and combustion system maintenance costs were cut from more than 50% on tugs to ⅓ the cost of gasoline on fork-lifts.

ALGAS equipped for LP-Gas operation.

In addition to the cost reduction indicated above, there is the saving resulting from longer engine life and less frequent major overhauls, with less downtime. LP-Gas, the modern fuel, combined with precision engineered ALGAS carburetion equipment are responsible for these substantial savings! You too can benefit by this money-saving combination on your internal transportation equipment.

ALGAS equipment is U.L. approved

Have you read "THE DOUGLAS REPORT?" Figures of the actual tests are available . . . write for your copy today.

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which it is used. In many cases it is unloaded directly onto continuous conveyors which carry it to the machines above. Finished component parts from the operating floor above drop down to this level for transportation to the next operation. The broad aisles need not be relocated when a new operation requires changes to the production layout on the main floor above.

Personnel Conveyed

Employee parking space is also provided in this lower level, permitting cars to be parked adjacent to locker and wash rooms located directly below the unit in which workers are occupied. Employees are conveyed to the manufacturing and office levels by means of continuously moving vertical lifts which level out at each floor. To ascend, we step onto a moving belt and grasp a handle on a moving hand-rail. As the belt enters a shaft we are automatically spaced about 8 feet apart and raised vertically one above the other. At the floor above, the belt levels out and conveyor continues on to the next level.

Nearby, sheet stock is being automatically fed from the floor below to a cutting machine. The pieces flow onto the next machine, which is the first of several forming operations. Further on they are conveyed vertically to an inspection room on the floor above where they disappear from view. Conversation is easy in spite of the considerable noise emitted by the individual machines. Reverberations and echos are absorbed by the acoustically treated ceiling at the level of the bottom chord of the trusses. This ceiling also glows, producing a feeling of natural daylight of low intensity. Supplemental lighting is also provided where required at individual operations.

The floor is a smooth, poured-in-place plastic of a pleasing mottled gray and white, which is kept spotless and non-slippery by a combination of light grinding and vacuum cleaning. The material is sufficiently resilient to expand and contract under temperature and flexual stress without cracking, and yet hard enough to prevent flowing under concentrated loads. If a machine is relocated, the plastic can be poured over the spot without detection of the match line with existing floor.

It is apparent that a great deal of attention has been given to streamlining construction details. Not only is appearance improved by this means, but a real cash return is secured by reducing clean-up and maintenance costs and by the elimination of sharp edges which can contribute to accidents.

The present trend toward outdoor plants in the continuous process industries will continue in the future. Large tanks, vessels, and major pieces of equipment will be exposed to the elements. Only control centers and operational headquarters will be housed. The reason, of course, is to save the cost of the enclosure and to simplify mak-

NEW LABOR-SAVING *AUTOMATIC* DOCKBOARD HAS *5 OUTSTANDING ADVANTAGES*

HI-LO®

Fully Automatic **DOCKBOARDS—**

- **Eliminate dock attendant**
- **Eliminate electrical, hydraulic and related equipment**
- **Eliminate specialized, costly maintenance**
- **Provide unmatched safety**
- **Are low in original cost — practically eliminate operating costs**

The *truck* supplies the power!

Hi-Lo Dockboards operate on a new lever and counterweight principle. *The backing truck automatically lowers the ramp into position.* Unloading can begin *immediately* without costly man-handling of portable dockboards, or manual adjustments of handles, valves or buttons. Hi-Lo's exclusive Tilt Adjuster maintains smooth, jar-free lip contact with the truck bed as loads are transported in and out of the carrier.

When the truck leaves the dock, Hi-Lo automatically rises and is ready for the next operation. When in cross-traffic position, Hi-Lo Dockboards carry 100% of rated roll-over load. The board is supported by *two* wide-spaced beams, not just a single center piston. The Hi-Lo's safety features protect men, equipment and materials from costly accidents and help cut handling time by as much as 40%.

New Folder D-155 gives you detailed information – shows why Hi-Lo Dockboards cost *less* to buy, *less* to install, *less* to maintain,—yet give you *better,* more efficient performance than dockboards costing more than twice as much! Use Coupon today!

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OBSTRUCTIONS

Continued

ing alterations as improvements are made to the process. Also, in some processes, such as pulp mills, fumes given off by the process are more corrosive than exposure to natural elements.

In the past, building enclosures have been built around industrial processes for a number of reasons. Workers, whose job it has been to tour the process to make continuous adjustments to valves, etc., must be protected from inclement weather. Protection must be provided for delicate instruments and gauges mounted on vessels and equipment. Steam piping and heated tanks must be housed to keep fuel losses down, and to prevent disastrous temperature changes in the operation with changes in the weather. Corrosion must be minimized. Legitimate as these reasons have been in the past, they are becoming obsolete.

The process plant of the future will appear to the layman as a neatly arranged field of large geometric shapes interconnected with streamlined conduits. The geometric shapes will be the processing equipment, such as digesters, pressure vessels, washers, screens, distilling towers and in-process storage tanks. The connecting conduit will contain conveyors, liquid and vapor piping, power lines and control wiring, the nerve system of the operation which will convey all data from the processing equipment to the control center.

Push-Button Control

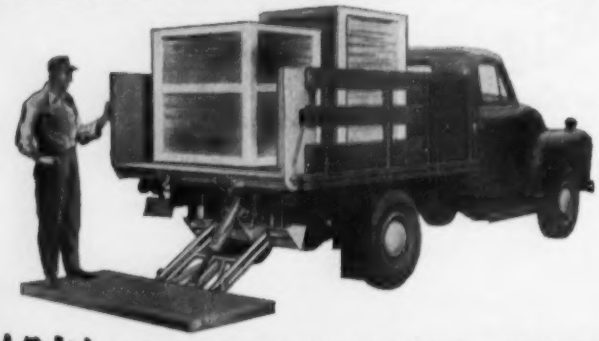
This center will be an air conditioned space housing all gauges, instruments and controls. A giant panel board outlining each step of the process will signal a warning before trouble arises. Any correction required to the speed of flow or quality of the product at any step in the process can be made by pushing the proper button. There will be no need to enter the process area except to make alterations or repairs to equipment.

Equipment will be individually insulated and optimum operating conditions will be maintained with individual self-contained heating and cooling units. This will greatly reduce the need for long, troublesome steam and cooling lines and will make the changing of a heating or cooling unit as simple as the changing of a motor drive. Changes to the process can be made without upsetting an elaborate heat balance.

Flexibility Afforded

Where it is necessary to house certain parts of a process the building shelter will be entirely independent of the equipment. It will consist of large steel or prestressed concrete arch bents spanning the entire operation. These bents will support multiple layers of translucent plastic material which will insulate as well as transmit diffused light. With the exception of light conveyors, piping and catwalks, all equipment will be self-supported from the floor. The structure can be readily dismantled and used elsewhere or the process equipment can be changed or revamped without altering the building proper.

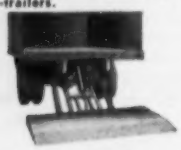
NOW...WHICH *SIZE* FITS YOUR DELIVERY NEEDS?



NEW ANTHONY "LIFT GATE"

For ¾-Ton and Larger Trucks

Model No. 146 handles up to 4000 lbs. on heavy trucks and semi-trailers.



Model No. 145 handles up to 2000 lbs. on 1½-Ton and larger trucks and semi-trailers.

Model No. 130 for Pick-up Trucks with steel express bodies.

This new lower priced Anthony Model No. 144 "LIFT GATE" handles loads up to 1000 lb. (other sizes from 800 to 4000 lbs. are available). Lift Gates in all sizes let one man do the work of three or more when loading or unloading a truck with heavy bulky freight — and in one-third the time. Loading and unloading is done with ease by moving one conveniently located lever to control the powerful hydraulic action of the "LIFT GATE". With the time saved in loading and unloading you can double your deliveries. Damage to merchandise and personnel accidents are greatly reduced. One "extra" delivery each day will pay for your Anthony "LIFT GATE". Write today for complete information.

ANTHONY LIFT GATE HYDRAULIC

ANTHONY COMPANY

Dept. 5505, Streator, Illinois

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ORGANIZATION . . .

(*Continued from page* 115)

an emergency nature easily controlled. Skilled technicians, conceivably located as much as miles from the job-site, will be able to direct each movement by a semi-skilled employee.

Industry is going to be forced to develop adequate facilities for the training of those employees that show an aptitude for understanding the concept as well as the mechanics of automatic production. One of the more important outcomes of this whole transition will be the reduction of present day monotony from repetition in production. The employee's new role will be made up of non-repetitive functions which will more fully tax his mental ability on a continuing basis.

More Research By Smaller Firms

This increased technical training will be closely accompanied by research and development on the part of smaller companies not currently engaged in such programs. The financial means for such efforts could very well be made available by the reduction of current in-process inventories. Integrated material handling "systems" will replace or encompass the present mechanical methods. This will have the effect of reducing the manufacturing cycle—operational time divided by the total time the material is in the plant. As a result the storage and warehousing problem will be greatly alleviated.

Plant construction will be even more influenced by material flow and consideration of personal comforts than it is today. Locker rooms, lighting, air-conditioning and employee facilities will be concentrated in the proximity of the heaviest movement of materials and greatest numbers of people. The trend toward single-storied construction with multi-level storage will continue. Already heights of 42 feet are successfully being attempted in the paper industry. These single-storied plants will have roof-top parking for employees.

The fact that machine tool operating speeds have been increased over 45 percent since World War II has served even more to illuminate the inadequacies of pre- and post-machine handling. The further use of automatic dispatching via conveyors, air-lifts and pneumatic systems for the distribution of parts and materials will be even more commonplace. Devices currently in the development stage—and elaboration on those now in use—will more easily find their way to the organized material handling section. The design as well as the operating problems of this new material handling equipment will touch on several professional fields—industrial, electronic, mechanical, instrumentation, chemical, communications—requiring more and more coordination. The trend toward continuous movement will show up bottlenecks, which will be more easily engineered out of the dependent material handling sequences.

Operation control tapes will be cut from blueprints prior to ma-

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the WORKHORSE of LIFT TRUCKS

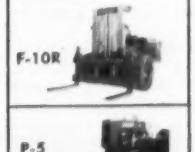
with a 30-Year Record for

- Rugged Dependability
- Remarkable Traction
- Ease of Handling

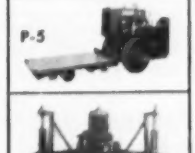
F-4R

F-6R

F-8R



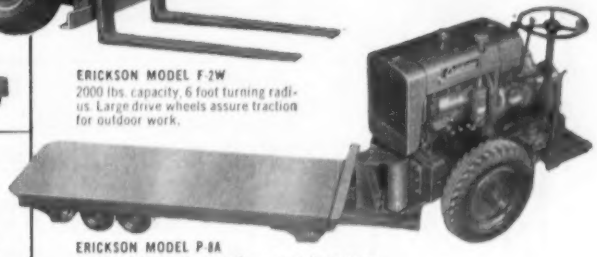
F-10R



P-5

POWER KART

Some other models in the complete Erickson line.



ERICKSON MODEL F-2W
2000 lbs. capacity, 6 foot turning radius. Large drive wheels assure traction for outdoor work.

ERICKSON MODEL P-8A
An articulated platform truck—a revolutionary new design with pivot between platform and drive wheels provides utmost maneuverability in small space. Eliminates wear of conventional steering parts.

There is no tougher proving ground for a lift truck than the concrete block industry. 30 years ago the first Erickson was built to meet the need for a more rugged, easier handling lift truck to stand up to the severe work conditions in that industry. Today Erickson Power Lift Trucks present to American industry a complete line of trucks that stand out for remarkable traction under ALL conditions, superb ease of handling, ruggedness and long life.

Erickson fork trucks from 2,000 to 20,000 lbs. capacity—platform models to 10,000 pounds capacity. 4 speeds forward, 4 speeds reverse. Erickson trucks are custom built to meet your individual needs.

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Materials Handling Exposition
May 16-20—Chicago, Ill.
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ERICKSON POWER LIFT TRUCKS, INC.
215 St. Anthony Boulevard, Minneapolis 18, Minn.

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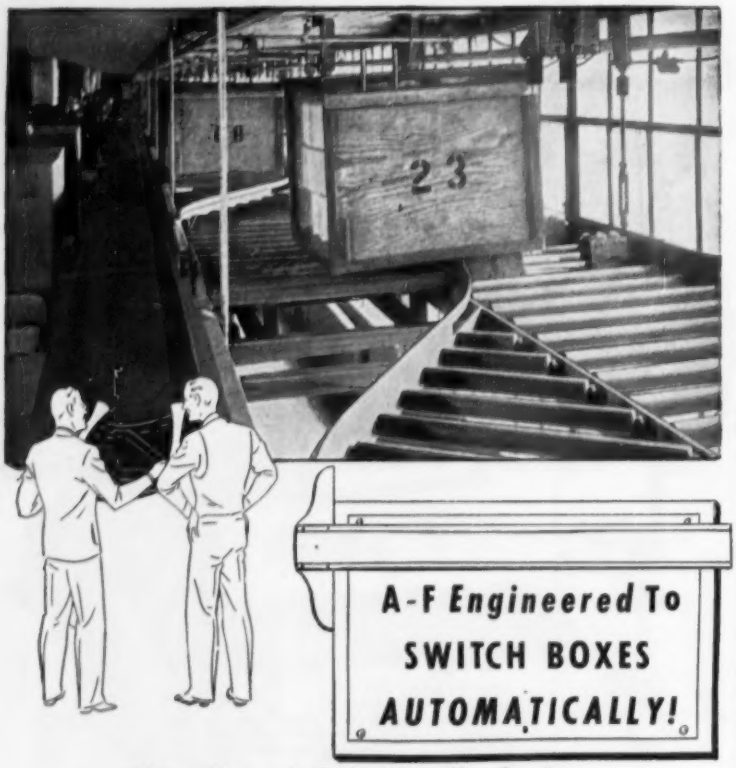
Continued

A-C's W. A. Roberts Dies

W. A. Roberts

W. A. Roberts, president of Allis-Chalmers Manufacturing Company, died suddenly April 12 following a heart attack. He was 57 years old. He joined the company in 1924 as a salesman in Wichita, and served in a succession of positions which led to the presidency in February, 1951. Under Mr. Roberts' direction, Allis-Chalmers was concluding an expansion program totaling more than 100 million dollars.



How New A-F Automatic System Increases Plant Efficiency, Lowers Costs!

TRAVELING TO their respective packing stations, these large, filled boxes switch themselves unerringly and more quickly than if "steered" by humans.

Yet, there are no operators . . . the switching is done automatically!

HERE'S HOW: The Main A-F Live Roller Conveying Line is equipped with automatic, air operated pick-up and roll-out sections. At the top of each box pins strike triggers at each station. These operate an air cylinder which lifts the roll-out section so that it becomes a switch from the main conveyor.

Since 1901, Alvey-Ferguson has engineered every type of conveying system for every type of industry. A-F Engineers can help *you* to move loaded pallets from floor to floor more economically . . . route and switch "trains" of cases automatically or . . . engineer a completely coordinated Conveying, Cleaning and Processing System for your plant.

For New Conveyor Catalog . . . write today

The Original Since 1901

THE ALVEY-FERGUSON CO.

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WEST COAST PLANT—760 N. Georgia Street, AZUSA, CALIFORNIA

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chine set-up. There will be no trial and error period. The first piece produced will be salable. Manufacturing errors, which will be less frequent in 1965, will be automatically detected and remedied. Quality control required prior to packaging will be largely overcome by statistical controls and precision inspection.

The packaging phase will be fully incorporated into more and more production lines. Carton-making machines and the likes will help by eliminating the current critical timing, handling and storage problem.

Automatic lubrication will be fully adapted by 1965. Such facilities will be engineered into new equipment design. Maintenance, as well, will share in the benefits of development. We can look for automatic tool dressing and setting facilities. Tool changes will be made automatically on a wear as well as an operating basis. Alarm systems will denote unusual wear in critical areas. Less and less maintenance work will be of a "fix-it" nature.

Cost Control Coming

A decade from now it will be the rule rather than the exception that material handling costs be directed to separate cost centers. Such a development will make cost reduction more feasible. Comparative performance may be a better guide than book value when considering the replacement of material handling equipment in 1965.

The guarantee of a push-button future is in no one's vest pocket. There will be many problems not already anticipated. Human engineering will have as much to do with the eventual success of such a development as any other single factor. One thing of which we can be well assured is that by 1965 the advanced level of material handling will be commonplace. Those willing to spend the time and money on research and development ten years from now will more than likely to be the same leaders of industry who find progress without them impossible today.

SUPERVISION TV . . .

(*Continued from page* 119)

When the assembled unit reaches the Body and Fender Department, a color camera directs the routing of the specific color of parts specified for the particular order number of that unit.

The above application is "two-way" in that the system will function as a TV intercom for observation of parts, drawings, charts, etc., in either direction.

A closed circuit TV system will be used within the next decade as an automatic control system in its own right. Whether the camera is monochrome or color will depend on the nature of the job to be done. The camera observes the "controlled" area or project, and the control unit functions as set by predetermined standards. The camera interprets any change in the gray scale of light, (or color balance changes in the case of a color camera) as amplitude variations in the camera signal. By comparing such variations against a standard in a cross-connected matrix circuit, a feedback signal is generated which tells the control unit what type of correction is needed.

How It Works

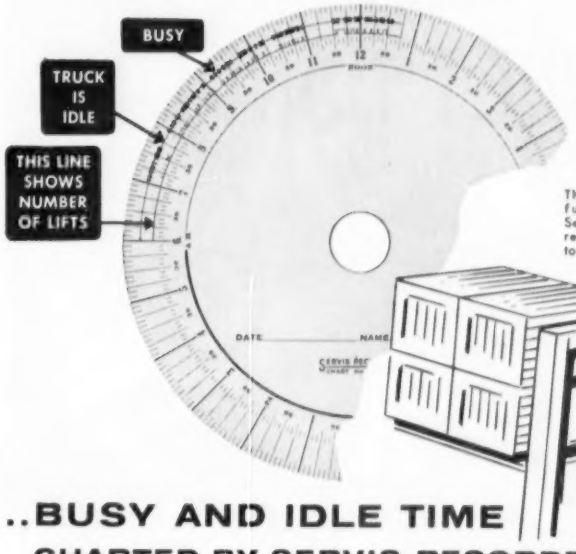
A crude example of this application is the training of a TV camera on a fence to be protected from trespassers. It is well known that alarms can be disabled by experts, since photocell systems using black light can be circummvented by going over or under the beam unless a series of such units are used. Assume a camera is trained on an entire fence from a great distance by using a long focal-length lens. An automatic iris is used which adjusts the lens stop opening in accordance with the light-level prevailing (photo-cell bridge circuit), and simultaneously "sets" the reference light levels of the "trigger" circuit. The entrance of a person or any object into the field of the camera vision will be interpreted as a change in signal level from standard, and actuate an alarm relay. The person or object can then be observed on the picture monitor.

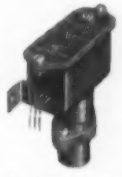
The practicability of remote handling of material by television observation is further advanced for some specialized cases by the use of three-dimensional transmission and reproduction. Closed circuit systems, unfettered by requirements of FCC transmission regulations, can utilize 3-D by either the two-channel prism optical method or a multiplexed signal corresponding to the difference between successive frames.

Computer Systems

The major significance of television's contribution in the next decade probably lies in the tie-in with computer systems. True automation, if the basic philosophy of the term is to be realized, cannot be limited by human "start and stop" time lags. The human eye enables interpretation only through the brain and the finite response time of the associated human motor system. Along with this fact is the necessary human judgement as to the correct "feedback", or correction, necessary for a particular circumstance.

NOW! LIFT RECORDS PLUS...





This Barksdale switch furnished with your Servis Recorder senses and records loads from 200 lbs. to the capacity of your truck.

..BUSY AND IDLE TIME
CHARTED BY SERVIS RECORDER

Now a new model Servis Recorder! Equipped with a Barksdale Hydraulic Pressure Switch, it records every productive load that exceeds a predetermined weight. Doesn't "weigh" a load, merely tells number of "good loads" a truck makes every day.

Originated in 1911, Servis Recorders have been faithfully charting idle and running time of industrial equipment. Now on the same permanent record you can get more complete cost information for each of your trucks. These same easily read charts are accurate for accounting needs, incentive pay systems and for maintenance scheduling.

Write today for complete facts.

See us at Sixth National Materials Handling Exposition, Booth No. 1027.

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1375D EUCLID AVENUE • CLEVELAND 15, OHIO

The Servis Recorder
Tells Every Move Your Truck Makes

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Continued

A computer functions automatically from a set of factual data presented, for example, by a punched card code. Human judgement, or thinking if you prefer, must properly code the problem to make clear to the computer what is desired.

In any application where the human eye and brain is capable of "reasoning" necessary correction of an error to obtain the desired end result, the TV camera and associated control system will perform with almost instantaneous results. This is to say that electronic reaction time, or "judgement" is infinitely less than that required of a human "operator".

Deviations Halted

To draw upon another crude example, suppose we train a TV camera upon the "ideal" product desired to be reproduced. This is the image which, ordinarily, the operator holds in his mind as the desired end product which he is fashioning (and continually correcting) with mechanical aids. Assume now that we employ a second TV camera to "observe" the product under creation. This is the eye of the operator through which he is enabled to judge the deviation, if any, from the ideal he images in his mind. A matrix is composed of "standard" reactive elements from the "ideal" image camera, and "interpreting" reactive elements from the "observed" image camera, cross-connected to form a "difference" signal which excites an analyzer amplifier. The matrix is analogous to the human brain which interprets visual response. The analyzer amplifier replaces the human motor response which reacts from the interpretation made, and provides the necessary feedback signal.

Surpasses Humans

Obviously this analogy need not be limited to the response of the human eye. The TV camera will be capable of "seeing" any portion of the energy spectrum required for the application.

In a sense, present use of computers requires plugging the human into the machine. One of the objectives of TV in the next decade is to replace the human connection with an electron connection. Human eyes, ears and brains can be replaced by super-eyes, audible and supersonic ears, and instantaneously exact brains.

More Skill Needed

It is axiomatic that this revolutionary era which we face will require increased skill and intelligence, rather than less. The field of systems engineering will be so broadened in scope as to place a still higher premium on engineers with wide knowledge and vision of the overall problems encompassed. The importance and necessity of specialization will not be decreased, but the caliber of engineers concerned with utilizing the combined output of specialization must increase in ratio to the acceleration provided by complete automation.

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ROLLSTOR SYSTEM
for better handling and storing of broadloom carpet

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MANAGEMENT TV . . .

(*Continued from page* 117)

and the necessary control applied to avoid mishap. Television offers a definite contribution here with the picture signals being transmitted to a central point where one operator can observe and control a number of junctions, or perhaps an entire system.

Traffic control is at best a compromise solution in any attempt to select the proper timing of traffic lights for various conditions. An auxiliary integrating counter which continually and automatically corrects timing as traffic dictates would materially improve the performance of a system. Ideally, intersections can be monitored by small television cameras, each transmitting to a central control point where one operator may adjust the system as conditions require. More important, however, is the fact that one operator observing many points simultaneously, may so manipulate control that traffic movement in any of the directions may be made to move continuously without a synchronized light system.

Use of Color

Color temperature of various heat processes is, of course, a very important measurement. Color television will not only measure main blast temperature, but fringe temperature as well, and at a mere glance at the picture. Similarly, if offers great attractions in its applications to blast furnaces, wherein so much can be learned from the observation of color temperatures of the molten materials, cake formations and the like.

The design and construction of overhead traveling cranes may well be revolutionized by television. Where drop distances are such that the operator cannot discern the required detail clearly, television will serve that purpose, be it monochrome or color. One such large crane is already equipped in this fashion. Yet the real advantage of this application has not been felt. Omission of the operator's cab provides reduced casts, improved clearances, and more accurate control in a completely remote-controlled crane design employing television.

The use of television as a means of meter and gauge reading is quite common. In many instances, it is more economical to remote the meters directly; however, this is not always possible, regardless of the expense. It should be pointed out, nevertheless, that unlike telemetering methods, television can never give a false meter reading. From this noteworthy application has come the conception of a new camera tube which is capable of the direct and continuous reading of one hundred or more temperature as translated by thermocouple elements.

The intriguing possibilities of IR (infra-red) television are endless. The employment of IR illumination, which is undetachable by the human eye, will allow transformation of scene information into visible light by an IR sensitive television system. The contributions which such a device will make in the manufacture of photographic film will be extensive.

"AMF LOWERATORS speed production with less physical effort..."

says R. E. Randall, Asst. Dir. of Public Relations, Burroughs Adding Machine Co., Detroit, Mich.

"Because AMF Lowerator Self-Leveling Work Positioners always pre-position materials at a constant level, the operator need never bend or move from his work position. This speeds production, with far less physical effort.

"What's more, AMF Lowerators give us balanced production from seven machines despite wide variances in their machining times. We've found, too, that our handling costs are reduced and less floor space is needed."

These advantages—and many more—can be yours. For full details send for *free* folder L-131. Best for continuous production runs. Trouble-free service. Available in standard or custom-built models. Wide range of size and weight capacities.

Another AMF Product

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See us in Booth # 1101—6th National Materials Handling Exposition

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Yes, I'd like a copy of your free folder, L-131, showing how AMF Lowerators help solve work-positioning problems. No obligation, of course.

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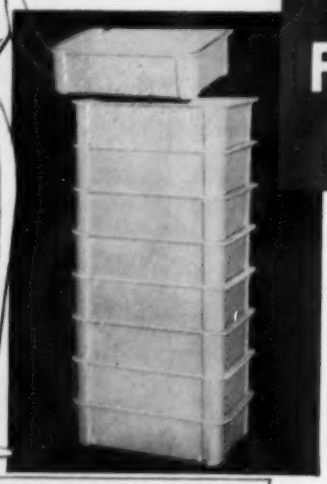
MOVE or STORE SMALL PARTS

IN THE NEW
FIBERGLASS
TOTE BOX



* light but strong to carry greater payloads
* last indefinitely without maintenance
* tare weight is uniform . . . and they *lock stack*
* no sharp edges or corners; accident-free handling
* TOTELINE tote boxes are available in color for easy identification.

TOTELINE

Write for Bulletin 435

MOLDED FIBERGLASS TRAY CO.

LINESVILLE • PENNSYLVANIA

World's largest producers of fiberglass reinforced resin trays and tote boxes

MANAGEMENT TV

Continued

There is hope for eliminating glaring headlights as a hazard in highway trucking operations at night. Windshields will be necessary only for daytime driving—IR highway lighting being employed with the road picture appearing on a television tube mounted in the dash and coming from a camera on the front of the truck. Push a button and a rear view mirror system flips into position in front of the camera.

The field of conference television is now taking shape, but for the most part, it has been limited to medical and sales conference work. For the latter there is no substitute for accomplishing personal contact with an entire sales force economically, and effectively. During one such TV conference, a large manufacturer reached 30,000 dealer salesmen in 30 regional cities at a cost of $100,000. This was an average cost of $3.00 per man. To have held the meeting in

8 HEILOADER ELEVATING TAILGATES
Save $900 a Month . . .
for KEENEY TRUCK LINES
Los Angeles Contract Carriers

Imagine saving almost $11,000 a year in delivery costs! That's what eight Heiloader Elevating Tailgates are doing for Keeney Truck Lines . . . putting a nice annual savings on the profit side of the ledger. Fewer man-hours loading and unloading . . . more deliveries per truck per day.

And dollar-saving isn't the whole story! Heiloaders are saving hours of backbreaking labor for Keeney drivers. One man loads many 25, 50 and 100-lb. sacks of flour and feed with no more effort than the flick of a finger.

You can prove to *yourself* that Heiloaders on *your* job will pay for themselves many times over in time and labor saved. Ask your Heil distributor about Heiloaders for handling loads up to 2000 lbs., or up to 4000 lbs.

BH-510

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DEPT. 6965

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HEILOADERS CUT DELIVERY COSTS 50%

- Save time! Trucks can make more deliveries per day in the time saved by loading or unloading up to 4000 lbs. at a time.
- Save labor! One man alone handles loads usually requiring two or three men.
- Save personal injury and merchandise damage claims!
- Save on maintenance! Only one hydraulic cylinder lowers and raises the platform, automatically opens and closes it as a tailgate.

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one location would have cost considerable time and an average of $200 per man for expenses.

Another form of conference television is business conference television. Though such service is currently available on a planned basis, the real attraction will apply to large industrial organizations which can justify privately-owned systems, leasing the interconnection facilities, and making use of them as continuously as possible. The trend toward decentralization will emphasize the importance of better liaison.

The extent of the possibilities of closed circuit television is limited only by the imagination and the economics are already in the permissable stage with technical developments promising even better conditions. The area to be exploited is application development and for this, manufacturers of television equipment must look to the potential users. As automobiles were first made with poor highways on which to drive them, so closed circuit television is ready for its highways to develop.

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FOR MATERIALS HANDLING
STANDARD AND SPECIAL

WHEELS: Metal - Rubber - Pneumatic

KEEP LOADS ALIVE

We take pride in our product and guarantee satisfactory performance and sturdy, long time operation under the most severe use. Agencies in most principal cities. Catalog gladly furnished upon request. Repeat orders testify to the efficiency of our trucks.

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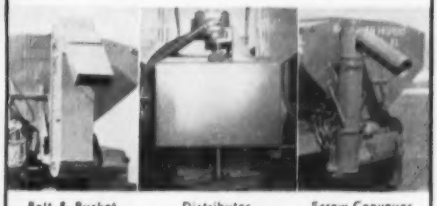
WITH THE SELF-SUPPORTING BULK BODY
THAT NEEDS NO TRAILER FRAME

5 METHODS of DISCHARGE

Belt Conveyor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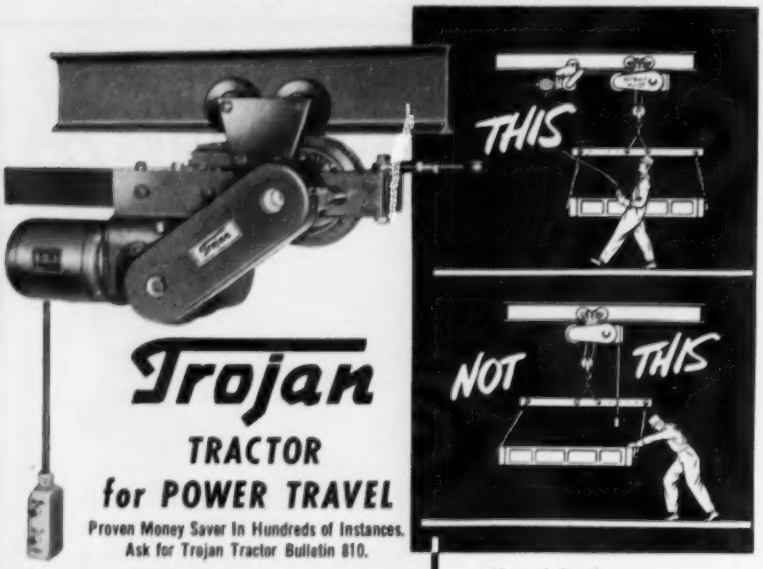

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Make your hand pushed hoists and cranes power traveled. Eliminate slow pulling and pushing drudgery. Speed up handling, save time, increase production, reduce costs. Simply attach a Trojan Tractor; inexpensive, quick delivery. Order one today.

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Hoist, Crane & Tractor Designers & Manufacturers
Since 1905

• *Also ask for the Detroit Hoist & Machine Co. New General Catalog 795*

Electric Traveling Cranes

Electric Hoists

EXPOSITION . . .

(Continued from page 136)

quires narrower aisles for turning, and can handle bulky objects.

4. Labor costs can be cut by reducing manual handling, and by better work-flow plant design.
5. New material handling equipment can be depreciated faster, more safely under the new tax law's "sum of the digits" method, allowing greater expenditure immediately for needed equipment.

Diversified Approach

The Conference will approach handling problems from every angle: receiving, warehousing, shipping, containers, palletization, storage patterns, loading and unloading, and "in-work" material movement, among others. The emphasis throughout will be on new

MANSAVER GRABS® FOR COILS OF ANY METAL

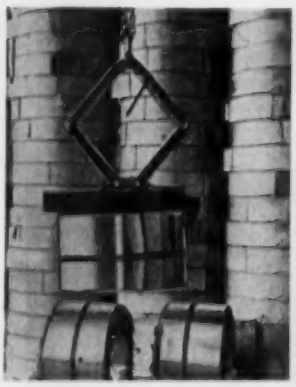
Mansaver Grabs handle coils of steel, brass, or aluminum in any required position or quantity. At left below is a fully automatic Mansaver Grab which takes one coil at a time or two side by side. This grab picks up and releases without manual attention.

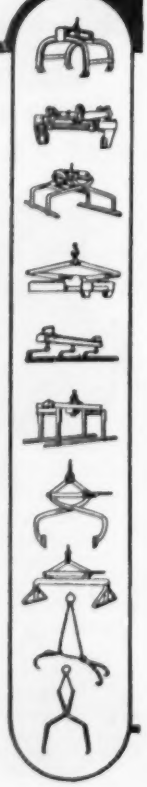
The grab at center, shown lifting one row of vertical coils, can reach down and take two rows deep at a time. The rows need only be separated by planks.

The model at the right picks up horizontal coils of varying width, using a minimum of aisle space.

All these styles can be altered to meet special needs, and still other designs are available.

Mansaver Grabs pay for themselves in savings. They cost little or nothing to maintain. These are proved facts. Write for name of nearest representative, who will be glad to show how this applies to your plant.





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techniques and new equipment to reduce costs and speed production. Every speaker and panel member is an expert in his field and will deal with his subject on the highest level. Problems of older plants are to be accorded special emphasis, but discussion of the latest advances in so-called "automated" installations will come in for major attention.

To Use New Hall

The 6th National Materials Handling Exposition will be the first ever to use the new hall which adjoins the International Amphitheater. This hall, all on street level, has been designed to fill the requirements of industrial show exhibitors and visitors alike. Combined with the Amphitheater, it provides more than 400,000 square feet of floor space. A feature of the new building is the scientifically planned lighting, providing 30 foot candles at working level. Parking facilities adjacent to the Amphitheater are reported to have been improved, to provide space for more than 4,000 automobiles.

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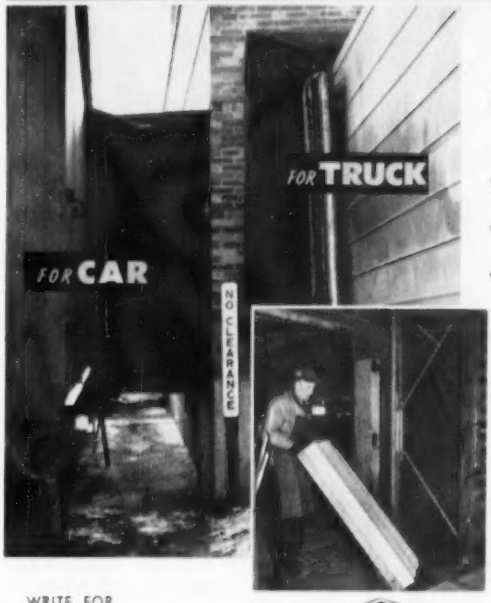
STOP PROFIT LOSS AT YOUR DOCK!

ALL-WEATHER PROTECTION for CAR or TRUCK!



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LOADING DOCK SHIELD

- PROTECTS PERISHABLES
- U.S. GOVERNMENT APPROVED
- SAVES HEAT LOSS
- EASY TO OPERATE
- EASY TO INSTALL

The Frommelt Loading Dock Shield helps maintain refrigerator car temperatures during loading or unloading. Eliminates drafts. Provides a no-drip, safe, draft-free dock at all times. Sturdy construction. Adjustable to ANY dock door.

- FOLDS FLAT, OUT-OF-THE-WAY, when not in use.

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Join the many firms Speeding Production and cutting costs . . .

PUT SPEEDWAYS ON YOUR PRODUCTION TEAM

the new SPEEDLIFT

- **elevates from either end**
- **versatile**
- **lightweight**
- **adaptable**

Speedways versatile portable power belt conveyor loads, bridges, unloads, stacks and acts as a conveyor line booster or assembly line unit . . . all with the same consistently high degree of performance. Either end elevates from controls at the center to a 30° incline, and it can be set horizontally from 22 inches to 5 feet off the floor. SpeedLift will go anywhere in your operation and one man can do all the work of moving, adjusting, setting-up or storing it.

Built to give long years of service, lightweight SpeedLift's features are usually found only in the most expensive equipment! Yet, SpeedLift is priced amazingly low.

ALUMINUM GRAVITY WHEEL CONVEYORS

SUPER

Light

Portable

Stronger, lighter, more adaptable than steel, Speedways Aluminum Gravity Wheel Conveyors save you money because one system will do double-duty throughout your plant. They are made from high-quality aluminum alloy which permits a live load of 850 lbs. per 10 lineal feet . . . and the smallest man in your plant can move them wherever needed. Adaptable to a variety of uses, Speedways Aluminum Gravity Wheel Conveyor's non-sparking frames help reduce fire hazards — make for better housekeeping, and because they are rust-proof, may be used outdoors in all weather.

These important performance features add up to big savings in your production set-up . . . savings in cost . . . labor . . . time.

There is a Speedways Conveyor to Suit All Your Needs

Let the Speedways Conveyor line be the answer to lower production costs. See your nearest Speedways Distributor soon or write:

SPEEDWAYS Conveyors, Inc., 202-208 Rhode Island Street, Buffalo 13, N.Y.

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1965: THRESHOLD . . .

(Continued from page 134)

in the antecedent buildings.

These vast edifices are what they are because of the demands men have made on engineers, metallurgists and chemists who have produced on demand, as always, whatever can be conceived and paid for.

That brings to mind the one-story fetish of the middle 1900's. How popular one-story buildings were because of their inexpensive character and high utility! What we see now are still one-story buildings—since each floor is wholly self-contained. But now each one-story is stacked on the next to the 100-story level.

In the middle 1900's, a New York mayor protested that—contrary to opinion—the biggest city in America was not dying. (The rush to the suburbs had scattered the middle class, leaving only the rich and the poor. Nuclear threat gave more and more point to the trend toward decentralization.

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This unbeatable combination makes BAY your best BUY!

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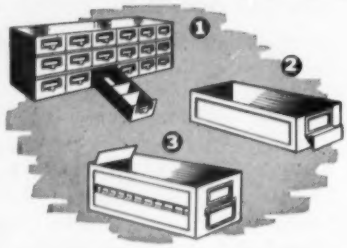

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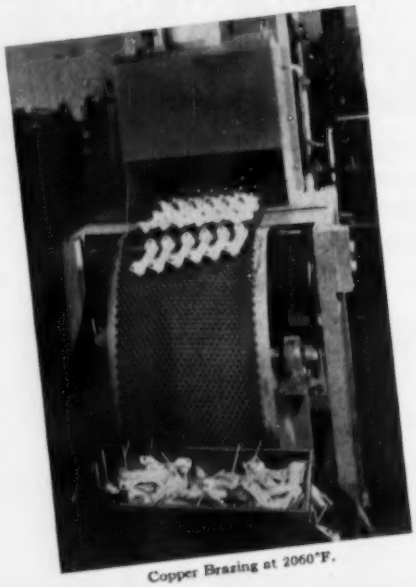

Copper Brazing at 2060°F.

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Woven from any metal capable of being drawn into wire form ASHWORTH belts afford a conveying medium in temperatures from sub zero to 2100°. Whatever your process—Ashworth belts can help you effect economies and

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New

ONE MAN RAMP

■ Yes! One man unassisted can position this ramp in one minute. Anti-friction wheels permit easy movement from one location to another. All steel welded construction, ramp has load capacity of 5,000 pounds per axle.

TWO STANDARD MODELS

- 5' wide x 6' long, adjustable from 2½" to 15"; weighs 480 pounds.
- 4' wide x 4' long, adjustable from 2½" to 10"; weighs 312 pounds.

Other Sizes Made To Order

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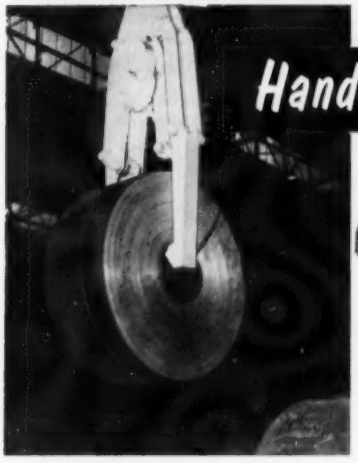
Taxes soared, with fewer capable to pay them. Old structures stood in the way of progress. Traffic was congested beyond belief.)

While opinion had it that all big cities were doomed to succumb in their own wastes, filth and congestion, the mayor held that five-years' growth in New York alone equalled the entire population of a city the size of Cincinnati—just the increase. With such growth in numbers, the problems of housing, transportation, policing, sanitation and public health bade fair to take a generation to solve—if the money could be found to foot the bill, and the city didn't collapse first.

But the mayor was prescient.

He knew that business is done in population clusters only; that people must live near their work, must concentrate to do their work. To decentralize any metropolis is merely to start new clusters, and more and more of them. All these trends were apparent in 1955.

We find in 2055 that the cities are larger than ever; smaller and smaller proportions of the people



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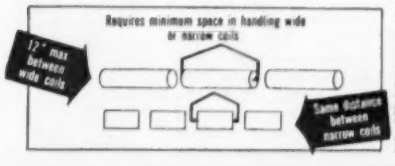
C-F LIFTER

ADVANTAGES

- 1 Lifter handles wide range of coil sizes
- Requires minimum of only 10" to 12" between piles —saves storage room
- 1 man operation — eliminates hookers
- Positive grip on coil — no damage to material

• C-F Coil Lifters are saving time and labor in many plants and warehouses because they can pick up, carry and set down a coil of steel faster and safer than any other method. Infinite jaw openings permit handling a very wide range of coil widths . . . carrying legs open fast, stay open until operator closes them on coil. Narrow legs require minimum space between piles – a space saving advantage. Made in motorized models for crane cab or pendant operation as well as manual types with chain wheel, in capacities from 3 tons up. Powered Rotating Heads available. Opening ranges to suit your requirements. Write for illustrated Bulletin.



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See Us at Booth 914-916, 6th National Materials Handling Exposition, Chicago

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MODERN FABRICATION RELIES ON EFFICIENT MATERIALS HANDLING

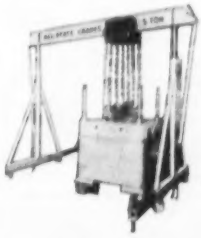
ALL-STATE Cranes
CUT HANDLING COST

Surveys show that material handling costs average 30% of total production cost. An ALL-STATE overhead crane will provide astonishing savings in both labor and time, enabling you to reduce these major production costs to a minimum.

JIB CRANES

Self-supporting, require no overhead support — ideal for outdoor crane service. Complete revolution possible for maximum coverage. Heavy Duty Ball Bearings. Capacities from 250 lbs. to 12,000 lbs.

Single Girder Type, Top Running Crane, Hand Geared, Motor Driven, Push Type. Available also in underslung or double girder style. Capacity 1 to 10 tons — up to 60 foot span.



GANTRY CRANES

with adjustable girder height — telescoping outriggers — ball bearing swivel casters.

FREE

Complete information upon request.

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TOW-LINE SYSTEMS CUT HANDLING COSTS 25% TO 35%

One of seven Nutting tow-line systems currently saving 25% in cross-dock handling alone for Consolidated Freightways, Inc.

Freight and materials handling costs have been cut 35% and sometimes more in terminals and warehouses equipped with Nutting Tow-Line truck systems. Nutting Trucks built to your "specs" can be filled off-line, then rolled to the line where they are engaged to the conveyors for movement to the next operation.

Nutting towline truck systems greatly simplify materials handling problems! In truck and railway terminals they effect big savings in cross-dock handling, reduce freight damage and speed up departure schedules with fewer astray shipments.

In warehouses, order picking operations are speeded up. One-way truck flow avoids confusion and eliminates costly multiple handling. Loaded trucks move to unloading bays . . . empties return to pickers and order fillers . . . all automatically!

This grocery warehouse installation is cutting handling time and speeding up delivery 35%.

Investigate this up-to-date method of handling materials. You'll discover too, that Nutting Trucks for tow-line systems, like all their more than 1000 models, have exclusive construction features that give you longer wear, lower cost maintenance and easy, trouble-free operation. Rugged construction from bar handles to demountable, free-wheeling rubber tires prove Nutting's QDC-64—*Quality, Design* and *Construction* for 64 years.

To get the complete towline story look under "Trucks" or "Casters" in your classified phone directory for your Nutting representative or write for Bulletin 54 TL.

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Export Sales Rep.: School International, Inc.
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Continued

live in the country, run rural businesses, produce foods for ballooning groups and the numbers living in the cities, consuming many more things, more and more of everything.

Ever-more-scientific and mechanical agriculture has freed more and more people from the small returns of back-breaking drudgery. Ever-more-scientific production and fashioning employ more people, despite the hundred-fold increase in output per man hour for which the machines have been responsible.

Death From Distribution Dearth

Distribution was, is, and always has been crucial. It is to the economy what blood vessels are to the organs, what the alimentary canal is to existence.

Without adequate and efficient distribution, modern society and

ONLY **$24.50** for this brand new GOVERNMENT SURPLUS

SLING GRAB

original cost—
$137.50

Look at these possible uses:

Lifting boxes, crates, logs, quarry stone, stone curbing, stonesetting and many others.

Entire assembly weighs 134 lbs.

Sling consists of 15 ft. of 6 x 19 wire rope ¾" in diameter with 6" I.D. ring. Will handle up to 5 ton load safely. Each grab face is 4" x 8" and has 8 replaceable teeth. Grab has handle for easy positioning. The Grab is a weldment.

Here is your opportunity to get a sling grab for an exceptionally low price while the supply lasts. Send your order now. Price is F.O.B. Elyria, Ohio.

ELYRIA BELTING & MACHINERY CO.
ELYRIA, OHIO

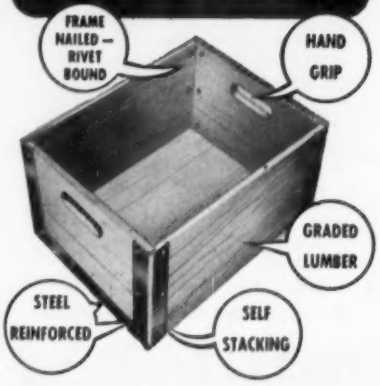
Circle No. 113 on Reader Service Card

CESCO'S TOTE-SHOP BOXES

DO YOUR ROUGH/TOUGH JOB EFFICIENTLY • EASILY ECONOMICALLY

on Conveyors • Pallets
Hand Trucks . Skid Platforms
or what have you

RUGGED CONSTRUCTION • PRIME MATERIALS



Model #WB (Wood Bottom)

Stock sizes will accommodate loads up to 200 Lbs., possibly greater, depending upon material packed and handling method.

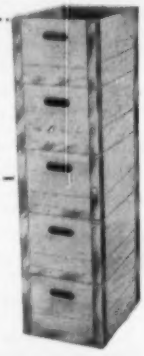
MODEL WB

STANDARD SIZES AVAILABLE FROM STOCK
(Prices net – F.O.B. Northhampton, Mass.)

Lots of	WB-1	WB-2	WB-3
2000	$1.96	$2.14	$2.28
1000	1.99	2.17	2.31
500	2.02	2.20	2.34
250	2.07	2.25	2.39
100 Min.	2.12	2.30	2.44

Model	Size	Length	Width	Depth	Weight
WB-1	I. D.	14⅞"	11¾"	9"	11½ lbs.
WB-2	I. D.	18"	11¾"	9"	13 lbs.
WB-3	I. D.	20"	11¾"	9"	14 lbs.

STACK SECURELY, CONVENIENTLY!



Solve your Storage and Handling Problems with our Tote Boxes, Trays and Pallets. Write today for quotations on special sizes. Special Marking Facilities, for identification purposes, are available in various colors and numbers. Please submit detailed specifications.

CESCO CONTAINER CO.
Factory: NORTHAMPTON, MASS.
General Offices:
Dept. (F) 475 Fifth Ave., New York 17, N.Y.

Circle No. 86 on Reader Service Card

Circle No. 296 on Reader Service Card

Safe DRUM Handling

Easy to install on any standard lift truck.

LIFTS
TRANSPORTS
STACKS

TRAY-HART. DRUM CARRIER

- Alignment compensator automatically places drums into gripping position.
- Carrier loads over drums.
- Gravity action causes gripping shoes to securely hold load.
- Release can only be effected by application of hydraulic pressure.
- Standard models handle standard 55-gallon drums in diameters from 22¼" to 24¾", and permit 6" variation in height in same load.
- Special types available for Monorail, Crane, and other applications.

TRAY-HART. CYLINDER CARRIERS

- All sizes and types of cylinders handled with ease.
- Quantity according to lift truck capacity.
- Write for complete information

Manufactured by

WALZ & KRENZER, Inc.

22 Flint Street, Rochester 8, N. Y.

civilization itself perishes. Man will always move things from point to point in greater or lesser weights and quantities, sizes, shapes, over lesser and greater distances. This must be done manually or mechanically, with stockpiling for and from the sources—all organized and situated for economic advantage.

We may not always depend upon the wheel for transportation (an aspect of distribution). Branch post offices have long been connected with headquarters by underground pneumatic tubes. Oil moves by pipeline. It is not beyond possibility that such devices or better substitutes may move common goods inter-city.

Man's imagination here is virtually unlimited. Back in the 1870's of 1830's there was designed a steam railroad that would have moved 300-foot ships across the Isthmus of Panama.

When distribution breaks down or is impeded, production and manufacturing grind to a halt and consumers stop consuming. Distribution is the chain that links the economic circle.

As our guide makes these points,

Why STERLINGS are MAN'S BEST Materials-Handling FRIEND!

ONLY 1/5th OF LOAD HERE

4/5ths OF LOAD HERE

Ask about liberal dealer sales plan

1. **ALWAYS READY** to use . . . no fuel or other "operating supplies" needed.
2. **NO "STARTING"** Problems . . . regardless of cold, heat, rain, dust.
3. **NO "HOUSING"** Problems . . . no protective warehousing needed, no covering, no "babying".
4. **NO MAINTENANCE** Problems . . . nothing to get out of order . . . rugged, long-lasting.
5. **EASIEST WHEELING** . . . with choice of pneumatic, semi-pneumatic or steel-tired wheels (with plain, ball or roller bearings.) These are the easiest rolling wheelbarrows made!
6. **EASIEST** on the barrow man . . . engineered to balance ⅘th of load on the wheel; only ⅕th of load at handle grips.
7. **EASIEST CLEANEST-DUMPING** . . . steel trays engineered to unload completely, with least effort.

Costs Less per Year

STERLING WHEELBARROW CO., Milwaukee 14, Wis.

Look for this Mark of STERLING Quality

Sterling WHEELBARROWS

Circle No. 268 on Reader Service Card for more information

HANG IT UP AND SAVE

The 'Budgit' Aluminum Chain Block answers the problem of on-the-spot hoisting at low cost. The ¼-ton 'Budgit' weighs only 29 lbs., yet the hoist is engineered so efficiently you can lift the full load with a mere 25-lb. pull on the hand chain.

If you have been looking for a lightweight chain block that combines strength with economy, speed with safety, investigate the 'Budgit'. From big, fast-acting load brake to non-fracturing hooks, this powerful hoist is packed with a long life of money-saving service for you. Capacities from ¼ ton up. Get details from your nearby "Shaw-Box" Distributor or write for Bulletin 398.

'BUDGIT' I-BEAM TROLLEYS *enable your hoist to travel as well as lift the load. They are ball-bearing equipped trolleys made of tough steel. Easily adjusted to fit various I-Beam sizes. Capacities: 500 to 4,000 lbs. Priced from $15.50. Write for Bulletin 390.*

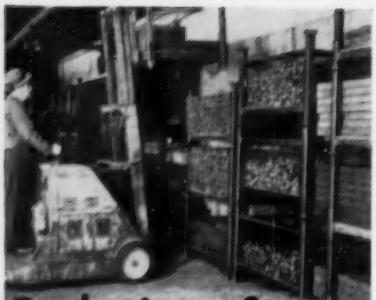
'Budgit'®

CHAIN BLOCKS

MANNING, MAXWELL & MOORE, INC.
MUSKEGON, MICHIGAN

Builders of "Shaw-Box" and 'Load Lifter' Cranes, 'Budgit' and 'Load Lifter' Hoists and other lifting specialties. Makers of 'Ashcroft' Gauges, 'Hancock' Valves, 'Consolidated' Safety and Relief Valves, 'American' and 'American-Microsen' Industrial Instruments, and Aircraft Products.

Circle No. 198 on Reader Service Card



Production and Storage

Costs cut with ERCO

STAK-PAL

system of Material Handling

STAK-PAL tubular stacking racks have been designed to handle quickly and efficiently your every storage need.

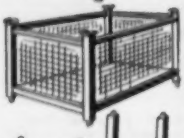
Stacking operations are safer, easier and trouble-free with removable corner posts or end frames.

QUANTITY PRODUCTION, STANDARD SIZES and our own SEAMLESS TUBE MILL assure you of a low cost product, combined with quality workmanship. All STAK-PAL tubing, square or rectangular has a minimum 11 gauge wall for rugged strength and almost complete elimination of maintenance costs. Specials made to specifications.

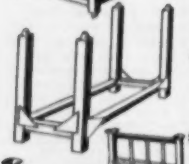
LET US PROVE THESE FACTS

Write for catalog giving complete information.

STAK-PAL
Three styles Type A with one center support in the basic for two-way entry. Type B two angle supports. Type C designed with six angle center supports, both of latter are four way entry.



STAK-BOX
Type X box and Type H bin box racks are for use with forks at least as long as the over all width of the racks and have angle supports similar to type B standard STAK-PAL racks.



COIL RACK
With the SK type coil rack considerable time is saved in handling and stacking.

END FRAME RACK
Type F Stak-Pal with removable end or side frames are desirable for handling of parts shorter than the space between the corner posts or for any parts requiring support between posts.

C. E. ROBINSON CO.

Manufacturers of Metal Products

222 COLBURN AVENUE
JOLIET, ILLINOIS

Circle No. 250 on Reader Service Card

Continued

he singles out another structure for attention. This is built on a hillside where last century we saw dumps. The slope is a perfect site since the building inclines from a higher to a lower level. What we are seeing is a distribution machine.

Brobdingnagian Warehouse

It is clear that goods slide downhill from a source to an outlet. The guide explains that the building is a Brobdingnagian, elongated honeycomb with several thousand cells. Goods are introduced into the cells by discriminating machines that select packs from inbound cars or trucks and guide them to the appropriate cell.

Output is handled completely automatically, following button pushing in an office operation. As keys are punched an invoice is produced and the goods arrive at the tailgates. Palletizing machines take over here and make up either pallet

NOLAN ONE-MAN CAR DOOR OPENER

Opens Any Box Car Door in 20 Seconds or Less! $37.50 EACH

FREE LITERATURE

F.O.B. NOLAN CO., BOWERSTON, OHIO

THE NOLAN COMPANY
110 Pennsylvania Street, Bowerston, Ohio

Please send ☐ ONE MAN CAR DOOR OPENER at $37.50
☐ FREE LITERATURE

NAME .....

ADDRESS .....

CITY ..... ZONE ..... STATE .....

Circle No. 220 on Reader Service Card

No. 852 STEEL SIDE-DUMPING HOPPER TRUCK. Side gate hinged on bottom extends to dump load away from running gear. Wheels remain on ground when body is tipped. Body is 36" wide, 60" long, 18" deep. Fifth-wheel steer and turning yolk for power unit towing.

No. 833 TOWVEYOR TRUCK. Reduces dispatching and sorting time in motor terminals and warehouses. Rigid all steel, all-welded frame with hardwood platform. Plastic or rubber tired wheels. Grease seals available. Clip board for instruction sheets, messages. Box for trip or inventory cards.

No. 855 FIFTH-WHEEL STEER TRAILER TRUCK. Rigid all-steel, all-welded frame with hardwood platform. 48" wide x 96" long. Equipped with dual 16" wheels, 4.00 x 8 six ply heavy duty pneumatic tires.

TOWSLEY

TASK TAILORED GENERAL and SPECIAL FLOOR TRUCKS

The trucks you see can be adapted to many uses. We have many more economical general purpose trucks to choose from and top flight engineers to develop new ones for your special job. If you have a unique handling condition that requires special planning, write or phone Towsley first.

No. 509 MANY PURPOSE SHELF TRUCK. All-welded, steel construction. Pipe push handles at both ends. Furnished with 3, 4, or 5 shelves. 12" or 15" space between shelves.

No. 200 GENERAL PURPOSE PLATFORM TRUCK. All-welded, steel construction. Platform available in steel or 1" hardwood stock. Level type wheel mounting. Accommodates a variety of end racks at each end.

No. 900 SEMI-LIVE SKID with KUM-A-LONG JACK. Ideal for receiving, shipping, storage and progressive assembly lines. Provides maximum materials mobility. KUM-A-LONG JACK pivots in a minimum radius. All steel or 1⅜" hardwood deck.

TOWSLEY TRUCKS, INC.
1770 ELMORE ST.
CINCINNATI 23, OHIO

Circle No. 282 on Reader Service Card

Circle No. 20 on Reader Service Card

Airmatic...

THE MODERN MECHANICAL MESSENGER SYSTEM

Airmatic pneumatic tube systems do their jobs so smoothly, so efficiently, so quickly that they don't receive any "fanfare" and "fuss". They're just taken for granted as time, labor and money savers in providing for the transporting of bottles, parts, samples, fragile medical supplies, complete files and IBM cards as well as the traditional uses for transporting papers and money.

There's an AIRMATIC SYSTEM for your need. Contact your local representative or the AIRMATIC home office for further information.

AIRMATIC SYSTEMS, INC.
378 Bergen Blvd., Fairview, N. J.
Phone: CLiffside 6-0475

or full truck units which are loaded and dispatched.

This is a perfect job for machines. Counters in the cells of the honeycomb can keep track of inventory, registering in the office where it can be photographed at regular intervals. Of course, a picture is needed only for insurance protection since the machines keep track of inventory for all operating purposes. By clever devices the shortcomings of earlier attempts have been overcome—difficulties with pressure, acceleration as the goods move down hill, cell-size adjustability and the earlier inability simultaneously to handle many lots in and many orders out.

Labor force is at minimum in this operation. Only a few engineers are needed to adjust the machinery and see that it stays in smooth working condition. Labor is too valuable in 2055 to be wasted in physical work that machines can do cheaper, better and faster.

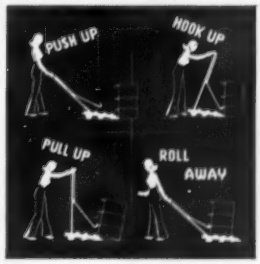
There is a great deal about this sort of thing we cannot understand from our guide's once-over-lightly discussion. He touches on electron-

NEVER UNDERESTIMATE THE POWER OF A WOMAN WITH "George"

Yes . . . women can operate this compact, almost-automatic, roller truck as easily as men . . . without dangerous lifting or strain. Hook is attached to heavily laden tote box, then forward motion of truck handle glides load over rear beveled edge of truck and onto upper set of rollers. Box is held stationary while lower traction rollers carry the truck to destination.

Low-cost, safe, smooth operation . . . long service life. One buyer uses 150 trucks . . . you can use one or many. Order now!

"George" THE TOTE BOX TRUCK



*TRADEMARK

LET "George" DO IT

Write for free folder F
ROLOCK Inc. • Fairfield, Conn.

3RG55A

Circle No. 254 on Reader Service Card for more information

COMPLETELY SEALED CASTERS

Another *first* for Albion casters! A completely sealed caster that stays sealed... completely eliminating the need for periodic maintenance due to grease loss, dirt, debris, water or other foreign matter.

Albion casters have been completely redesigned to incorporate precision *moulded* Synthi-Rubber ring gaskets around the load raceways and the wheel axle ends. In addition, a formed steel, leakproof retainer cup is press-fitted over the thrust raceway . . . thus, Albion's *completely sealed* casters outlast ordinary casters and save your equipment dollars.

HERE'S WHY . . . Albion caster engineers would not accept the so-called "sealed casters" available which employed flat rubber, felt or steel baffles as "seals". As a result, they designed and developed precision *moulded* Synthi-Rubber gaskets to guarantee a truly sealed caster to solve your caster problems.

Albion's new completely sealed casters are available in a broad range of popular sizes and wheel types to suit your needs.

ai

See them at the CHICAGO MATERIALS HANDLING SHOW Booth 1906

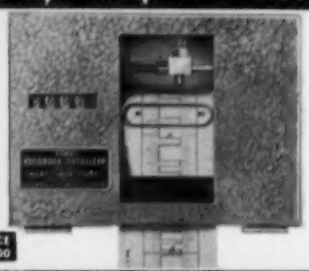
ALBION INDUSTRIES, INC.
ALBION, MICHIGAN

Circle No. 22 on Reader Service Card

Circle No. 150 on Reader Service Card

OPERATION RECORDER PLUS TOTALIZER

for machine, process, system analysis in plant or office



TIME RECORDER—TOTALIZER

provides continuous, accurate performance data about machines, processes and systems in any plant or office. Automatically records on a chronologically marked chart roll—one roll lasts four months—the time and length of every "on," every "off" period of the equipment. Also computes total "on" time. The TIME Recorder—Totalizer is suitable for remote and multiple installation. Rugged construction . . . tamperproof.

write RECORDER DIVISION, Dept. F-1

HEAT-TIMER corporation
657 Broadway • New York 12, N.Y.

1965: THRESHOLD

Continued

ics and feedbacks and memory banks in machines that are the highly developed scions of the early punched card devices we knew in the 1900's.

We can't dwell too long on these. Our guide is calling for us to strap in again, warning us that take-off is coming—5, 4, 3, 2, 1, and blast!

We are back in 1955 an instant later. Time enough now to reflect that a century hence man will have built himself a world ten times more amenable to his comfort, since progress is geometric. We ourselves are twice as well off materially as those who lived in the 1850's.

The path is ever upward. The rate is accelerative. Man spent thousands upon thousands of years learning to improve flint tools, and only several hundreds advancing through all the presently accumulated arts and sciences.

Man's destination? It's just over the next threshold.

Circle No. 208 on Reader Service Card

MOVE MORE FOR LESS WITH MICRO LEVER-DOLLIES

Immediate Delivery

Made in Three Handy Sizes

Usually Purchased and Used in Pairs

Reasonable in Price and Guaranteed

Finest Materials and Workmanship.

After First Use You'll Wonder How You Ever Got Along Without Them

Write for complete descriptive circular

MICRON, INC.,
Dept. F
BETTENDORF, IOWA

Rubber Wheels Optional

HANDLING BULK MATERIALS?

"TAKE IT UP A FLO-TUBE"®

CANTON STOKERS

The spiral conveyor of steady, dependable service. Sturdy cast iron trough bolts together in 3 ft. sections, capped with steel plates for easy removal if ever necessary. Built to take the abuse of coal, yet with tolerances just right to handle materials from grain size to lump.

To fill 3 or more hoppers use gate-valves in Flo-Tube horizontally. Below, filling 2 hoppers with "Y" chute.

Hopper level maintained by 'off-on' automatic switches.

Exposed end for pick-up

CANTON STOKER CORP.

SPECIALISTS IN AUTOMATIC COAL FIRING, HANDLING AND CONTROL EQUIPMENT

108 ANDREW PLACE S. W. • CANTON, OHIO

Circle No. 10 on Reader Service Card for more information

Photo taken in Cost Dept., Becton, Dickinson & Co., Rutherford, N. J.

DENOMINATOR Saves 50% Clerical Analysis Time on Production Inspection Reject Reports

Becton, Dickinson & Co., manufacturers of high quality surgical instruments, take exceptional care in the production of their products. For example, inspection tickets—attached to all batches of glass syringe parts—list 20 possible reasons for rejection. Record of actual rejects is made as these tickets move with the work.

Weekly analysis of over 3000 reject tickets formerly required two operators—now only one operator is required, using a 20 unit *Denominator!*

What's your sort-and-count problem? For free illustrated brochure write Dept. FM-53.

The DENOMINATOR COMPANY, Inc.
261 BROADWAY, NEW YORK 7, N. Y.
Manufacturers of Tabulating Machines for 40 years

Circle No. 106 on Reader Service Card for more information

NEW EQUIPMENT . . .

(*Continued from page 64*)

Collapsible Canvas Container

Latest product of Paltier Corporation is a Canvas Container which permits handling of bulk solids at what is said to be marked savings. The unit consists of a canvas container and aluminum or steel base and tiering posts. The container can be furnished in canvas, duck, water resistant materials, rubber or plastic. It is available with zipper, straps or other type closures for protection of contents, or with open top with hook-on type container. When not in use, the container collapses flat with the base.

Write 384 on Reader Service Card for more information

Shelves on Tracks Increase Storage Capacity

A new mobile storage system has been introduced by Dolin Metal Products, Inc. The company claims the mobilization technique can increase cabinet or shelving capacity of present areas from 30 to 70 percent without the need for

Chainless Conveyor Cuts Costs

Makes Short Turns

Bolts Together
Easier to Install
Easy to Relocate

Landahl CHAINLESS Conveyors handle any normal load at lower cost! No chains or cables to sag, buckle, get fouled up . . . no excess slack to cause jolts. Self-lubricating over long periods. Takes minimum space. Permits small-radius turns; *without special traction wheels, sprockets or extra rollers at corners.* Uses unique self-contained caterpillar drive. Simple "nut-and-bolt" assembly makes it easy to install or relocate any time.

Write for new bulletin G-100 today

Recommended for loads up to 100 lbs. per ft.

LANDAHL **Chainless** CONVEYORS

The LANDAHL CONVEYOR CO., 13129 Athens Ave., Cleveland 7, Ohio
A SUBSIDIARY OF THE AMERICAN MONORAIL COMPANY

Circle No. 183 on Reader Service Card for more information

For "Traffic Volume—Minimum Maintenance—Minimum Closing Time"

install RUBBAIR DOORS!

Tileston and Hollingsworth Company, one of New England's oldest and most famous papermakers, wrote us a letter, saying in part—

"The doors were installed in our Machine Room, where traffic moves twenty-four hours a day, six days a week. Trucks are continually smashing into the doors, as rolls are moved from the paper machines into the finishing area. The doors have given almost trouble-free operation since installation. The Rubbair Door operates faster than any other we have used."

Rubbair Doors speed handling, reduce repairs, protect loads wherever doors must be hung in an industrial operation.

Check these advantages:

- **Improved insulation**
- **Reduced noise, industrial fatigue, injuries to personnel**
- **Protection from damage to trucks, pallets and loads**
- **Speedier handling of materials**
- **Greatly lowered maintenance costs**

For complete information write—

Stic-Klip® **Rubbair Door Division**
MANUFACTURING CO., INC.
47 Regent St., Cambridge 40, Mass.

Circle No. 272 on Reader Service Card for more information

Circle No. 156 on Reader Service Card for more information

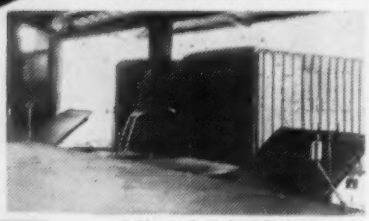
STOP PROFIT LEAKS—CUT HANDLING COSTS with a

DO YOU LOSE YOUR PROFITS ON YOUR DOCK?

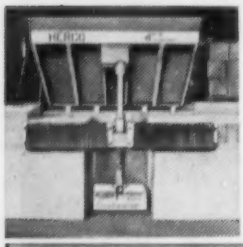
HERCO
ADJUSTABLE
DOCKBOARD

You can lose money and profits just as easily in slow, wasteful handling on your dock as in your plant—and it's all part of your production costs.

2 SIZES
48" x 72" and 60" x 72";
20,000 and 30,000 lb. capacity in both sizes.



4 Herco dock installation at Novi Equip. Co., Novi, Michigan.



Adjust up—down—left—right in seconds.
Positive lock in UP position; automatically follows carrier level in DOWN position.
Patented spring action counterbalance automatically adjusts weight to dock.
Economical to install in old or new docks.
No maintenance required; hardened gears give lifetime service.

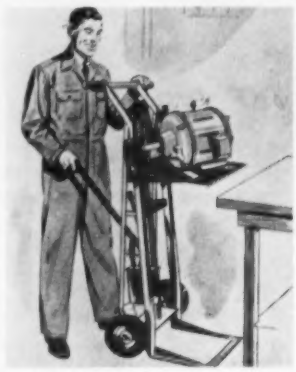
Karl A. HERMAN Company
412 FULLER AVE., N. E. GRAND RAPIDS, MICH.

additional floor space, and also allows for utilization of existing equipment. In operation, existing storage units are placed on a series of tracks. One row of fixed units is placed directly in back of two mobilized rows, each row containing one unit less than the fixed row. By multiplying this technique by as many such arrangements as the area will permit, all units are available at any time.

Write 385 on Reader Service Card for more information

Combined Hand Truck, Stacker

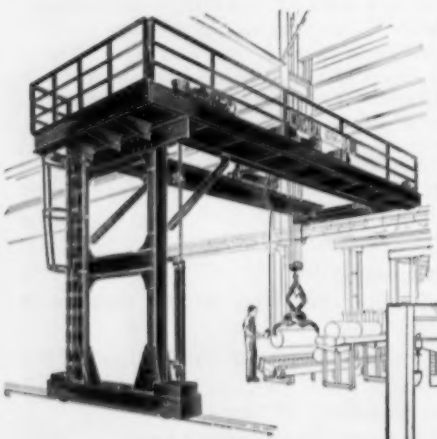
A combined pallet-lift stacker and hand truck, capable of lifting a quarter ton, moving loads with perfect balance and stacking from floor level to 36 or 54 inches, is offered by Allied Manufacturing & Sales Co. Called Varilift, the four speed hydraulic Grand Shop Caddy is said to save time and money. Four models are available, all with eight inch roller bearing rubber wheels. Platform sizes are 16 by 20, 19 by 22 and 22 by 30 inches.



Write 386 on Reader Service Card for more information

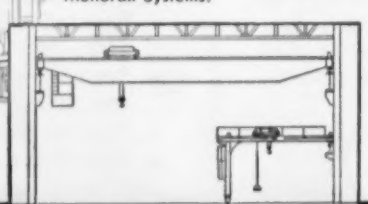
Industrial SEMI-GANTRYS
for LOWER COST Handling

Another dependable member of the "Industrial Line" of Quality Cranes



Used in conjunction with other cranes Industrial Semi-Gantrys often effect great savings. Here the Industrial Semi-Gantry loads billets onto conveyor, while heavy overhead crane is released for other duties.

Consult with Industrial Crane & Hoist Corporation for ways and means to lower your materials handling costs through most efficient use of Overhead Cranes, Jib Cranes and Monorail Systems.



SO1254

INDUSTRIAL CRANE & HOIST CORPORATION
1531 SOUTH PAULINA STREET CHICAGO 8, ILLINOIS
Overhead Cranes • Jib Cranes • Monorail Systems • Crane Runways
Representatives in Principal Cities

Circle No. 168 on Reader Service Card for more information

NO SCRATCHES
WITH
STILSON ROLLERS

The original STILSON all-neoprene molded conveyor rollers have even density throughout insuring uniform wear.
For die lifters, hydromatic welders, gravity roll conveyors, idlers on belt conveyors, many other uses.
Provide cushioned, quiet, scratch free, dent free rides for finished stampings, panels, glass, plexiglass, stainless steel and other materials.

FIVE MODELS—THREE DENSITIES

4" DIA.— 2" WIDE
2½" DIA.— 2" WIDE
DUAL BALL BEARING ALLOY AXLE—SELF LOCKING NUT

ALL PARTS INTERCHANGEABLE

STILSON TOOL, INC.
30229 GROESBECK HWY.
Phone Prescott 8-2010 Roseville, Mich.

Circle No. 271 on Reader Service Card

Hook Assures Complete Safety

E. D. Bullard Company is manufacturing a safety hook which provides a gate lock for preventing accidental disengagement of the hook from the sling, line or object being lifted. Gates have a protective recess which guards pin against accidental opening. In closed position, the gate locks automatically and cannot be opened unless pin is manually depressed in opposite direction of gate opening. Hooks are of drop forged steel and non-corrosive safety gates are of brass, available with or without return spring for automatic closing. Capacities up to 50,000 pounds may be safely lifted with the hooks.

Write 387 on Reader Service Card for more information

Shovel-Crane Has Short Turning Radius

Introduction of a new self-propelled ⅜-cubic yard, six ton shovel-crane is announced by Schield Bantam Company. Called the model CR-35, turning radius is 15½ feet, taken at center line of

NOW! YOU CAN BUILD YOUR OWN S-A CONVEYOR WITH THE... SACO SECTIONAL BELT CONVEYOR

Includes the following components ready for assembly in your own plant: • HEAD and TAIL PULLEY ASSEMBLIES • NORMAL DUTY HOLDBACK • SPRING-TYPE BELT CLEANER • #745 CARRIERS • #745 RETURN ROLLERS • CONVEYOR BELT • DRIVE ASSEMBLY • STEEL DECKING

IN STOCK for IMMEDIATE DELIVERY

featuring #745 BELT CONVEYOR CARRIERS

WRITE TODAY FOR COMPLETE INFORMATION

STANDARD PRODUCTS DIVISION
STEPHENS-ADAMSON MFG. CO.
36 Ridgeway Ave. Aurora, Illinois

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POWER STEERING

STANDARD ON NEW truck-man W-40

*TWO TON HIGH-LIFT

THE DRIVER IS BOSS—Not the truck. Power steering means one finger turning, even at a standstill—Reduces operator fatigue and increases efficiency. No tripping over levers or hoses getting on or off either, all dials and levers are just inches below the steering wheel where they belong for effortless handling and added safety. Tilting mast (10° backward, 3-5° forward), speedy lift and 6 inches of free lift complete the picture of a real material handling tool.

POWERHOUSE ON WHEELS—The sturdy, 4 cylinder, industrial engine produces 40 Brake Horse Power — Oversized clutch, transmission and Timken drive axle deliver it without strain. Extra wide tires, front and rear provide the traction to take full advantage of it. Speeds up to 8 mph., forward or reverse.

COMPACT—Intersecting aisles need be only 64" wide. Only 38" x 76¼" (less forks), the W-40 turning radii are only 2" inside and 71" outside.

A SOFT TOUCH FOR MECHANICS, TOO—Here's a truck *designed* for economical maintenance. Tilt cylinders, engine, transmission, clutch and other wear parts are easily worked on or removed.

VERSATILE—Standard Lift is 108"—others to order. A wide variety of fork styles and attachments are also available.

LOTS OF OTHER FEATURES—including: double acting hydraulic brakes, honed tilt and lift cylinders; but why not get the complete story? Even with power steering and extra capacity the W-40 costs less. Call your Truck-Man dealer or write today for folder and price information on the NEW TRUCK-MAN W-40.

OTHER truck-man TRUCKS
MODEL Y-40—TWO TON, OUTDOOR HIGH-LIFT
MODEL DHP—4500 LB., LOW LIFT SKID TRUCK
MODEL DFP—3000 LB., LOW LIFT PALLET TOTER

truck-man DIV. OF THE KNICKERBOCKER CO.
582 LIBERTY ST., JACKSON, MICHIGAN

Circle No. 281 on Reader Service Card for more information

Circle No. 239 on Reader Service Card for more information

✓ Reduce Handling Costs Up to 50%
✓ Increase Storage Space Up to 85%
WITH RACK WIRE PALLET STOCKTAINERS®
• Save Floor Space
• Speed Up Shipment
• Increase Safety
• Lower Shipping Costs
• Make inventory control accurate

Safe stacking position.

Collapsed for return shipment or storage.

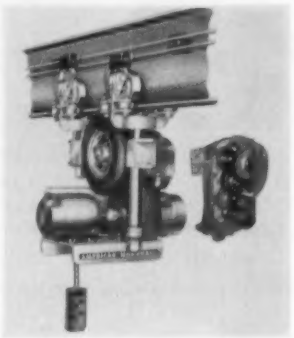
RACK Engineering Company
131 SIXTH STREET
CONNELLSVILLE, PENNSYLVANIA
GARDENA, CAL. • FARNHAM, QUE. • LONDON, ENGLAND

axles. This is the shortest self-propelled turning radius in the shovel-crane industry, according to the manufacturer. Also featured is two-speed independent travel which allows the operator to work the upper deck machinery and travel at the same time. Steering mechanism and brakes are controlled hydraulically.

Write 388 on Reader Service Card for more information

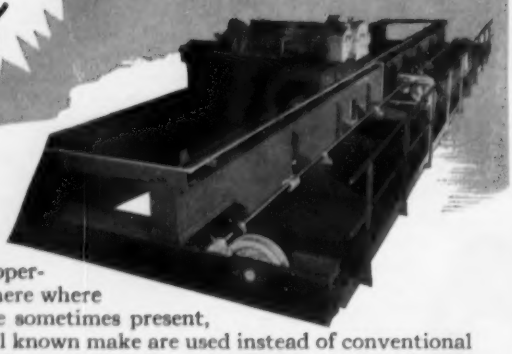
Monorail Drive Unit

American MonoRail Company is offering a precision built drive unit to propel a hoist or other type carrier on monorail track or crane bridge. Traction is obtained by spring-loaded contact of the rubber wheel against the bottom of any smooth flange track. Speed ranges from 35 to 350 fpm; power range is from ¼ to 2 hp. Any standard NEMA frame motor and any type motor brake may be used, and there is an automatic adjustment for tire wear. Capacity is 5 tons.



Write 389 on Reader Service Card for more information

Explosion Proof AIR CRANES!



Since this crane operates in an atmosphere where explosive gases are sometimes present, air motors of a well known make are used instead of conventional motors. The crane is controlled from the floor and embodies all the characteristic features of operation and durability for which Euclid cranes are well known.

If you have an unusual problem, Euclid engineers can render sound advice based upon many years of specialized experience.

If you need a standard crane, there is a Euclid that will give smooth, efficient service for years to come with minimum repair and maintenance costs. Let us send you the new Euclid catalog.

The EUCLID CRANE & HOIST Co.
1362 CHARDON ROAD
CLEVELAND 17, OHIO

Circle No. 118 on Reader Service Card for more information

HERE'S HELP!

INVESTIGATE Hapman Neoprene-Flighted, Sealed-Pin Chain Tubular Conveyors. They move almost any flowable material, wet or dry, through any plane or angle. Dust-proof, liquid and odor tight.

Write today for Catalog F-55.

Hapman CONVEYORS, INC.
Division Hapman-Dutton Company
623 Gibson St., Kalamazoo, Mich.

Circle No. 152 on Reader Service Card

Tracks Move Skids and Pallets

A double trackage system for moving skids and pallets has been developed by Engineering Products Co., Inc. The rolling function is performed by the Epco trackage itself which consists of a series of rollers containing easy running sealed ball bearings especially designed for floor operation. The trackage can be installed into loading docks, bridges, scales, elevators or wherever required. Turntables are used to change direction. The system makes it easy for one man to move heavily loaded skids from machine to machine or along assembly lines without delay, according to the manufacturer.

Write 390 on Reader Service Card for more information

Instantly-Reversible Motor

An instantly-reversible fractional horsepower motor especially designed for use on door operators, machine tools, cranes and hoists has been developed by the General Electric Company. Sizes are ¼, ⅓, ½ and ¾ hp, and motors are available in 115- or 230-volt, single voltage rat-

ROLLAWAY SEMI-LIVE SKIDS AND JACKS

FEATURING THE RE-NU TOP

Steelbound Rollaway Skids combine the best features of bolted and welded designs. The frame supporting members are arc-welded, and the renewable hardwood deck is tightly clamped with steel bolts of extra tensile strength. Welded-in, heat-treated, steel connecting pin. Semi-steel rubber-tired or Flor-Savr wheels with Hyatt roller-bearings, heat-treated steel axles.

CAPACITIES:
1500, 2500, and 5000 POUNDS
YALE AND TOWNE ROLLAWAY JACKS are stocked at the Lanham Company's plant and are sold and shipped directly from Keokuk for use with ROLLAWAY SKIDS.

LANHAM SKID CO.
DIVISION OF THOMAS TRUCK & CASTER CO.
587 On the Mississippi River, Keokuk, Iowa

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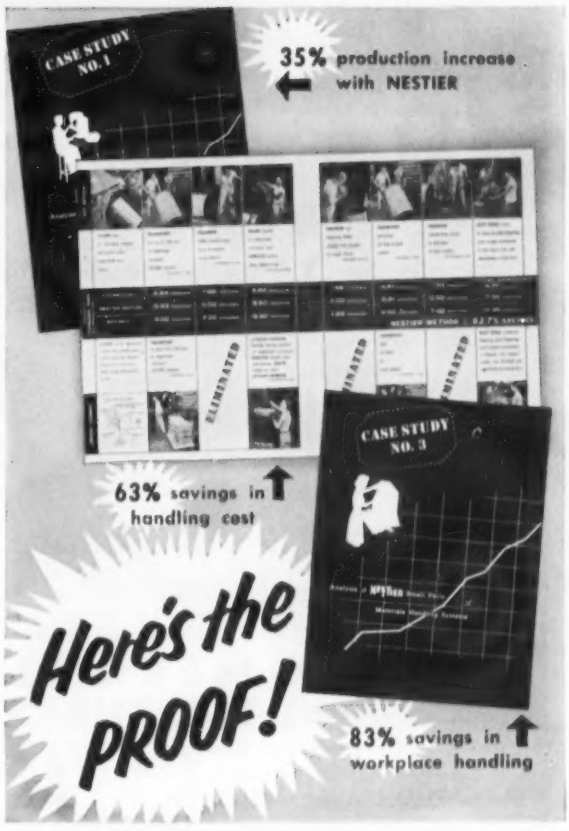
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35% production increase with NESTIER
63% savings in handling cost
CASE STUDY NO. 3
Here's the PROOF!
83% savings in workplace handling

NESTIER SMALL PARTS HANDLING SYSTEMS SAVE YOU MONEY

NESTIER BOXES AND BASKETS

NESTIER HOPPER RACK ASSEMBLIES

NESTIER ROLLOVER HOPPER

3 case studies . . . just off the press . . . giving absolute proof of NesTier's success in cutting costs and increasing production . . . yours for the asking. Each illustrated study details methods and times, "before NesTier" and "with NesTier", for each element of specific operations. Made by an independent firm of industrial engineering consultants, case studies cover:

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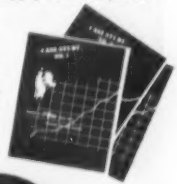

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C-237-DN

The Chas. Wm. Doepke Mfg. Co., Inc.
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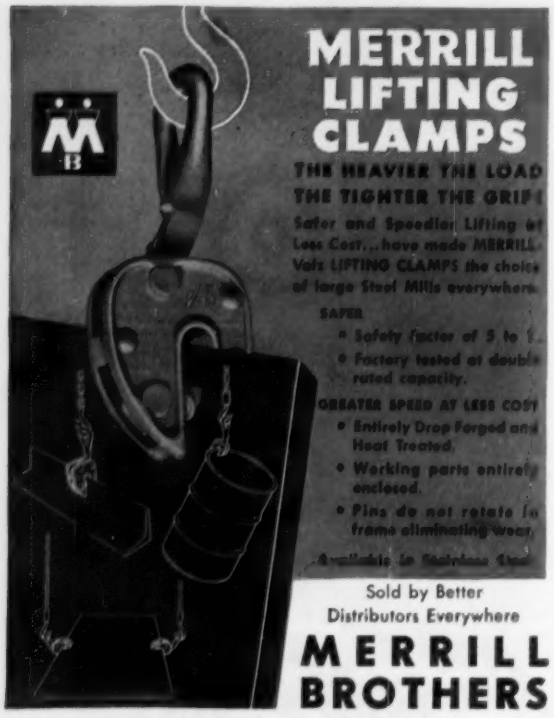
MERRILL
LIFTING
CLAMPS
THE HEAVIER THE LOAD
THE TIGHTER THE GRIP!
Safer and Speedier Lifting at Less Cost...have made MERRILL-Vaiz LIFTING CLAMPS the choice of large Steel Mills everywhere.
SAFER
• Safety factor of 5 to 1.
• Factory tested at double rated capacity.
GREATER SPEED AT LESS COST
• Entirely Drop Forged and Heat Treated.
• Working parts entirely enclosed.
• Pins do not rotate in frame eliminating wear.
Sold by Better Distributors Everywhere
MERRILL BROTHERS
For Interesting Information write
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3-K-2-R

ings. All motors operate at 60 cycles, 1725 rpm. There is a large, built-in, five-stud terminal board with reversing connection diagram on inside of terminal box cover for quick installation, according to G-E engineers. The external switch can be thrown from one polarity to the other as rapidly as is mechanically possible.

Write 391 on Reader Service Card for more information

Maintenance-Free Hoist

Chisholm-Moore Hoist Division, Columbus McKinnon Chain Corporation, has introduced an electric chain hoist which is designed to serve its normal life without maintenance. Termed the CM Lodestar, the hoist also features shock-proof push button control, sealed-in lifetime lubrication, self-adjusting heavy duty brake, overload protection, fully enclosed and protected components, safety limit switches, light weight, and extremely compact size and low headroom.

Write 392 on Reader Service Card for more information

UNITABLE®
BELT CONVEYOR
For Assembly - Inspection - Packaging
The most ADAPTABLE portable conveyor you can find. Exclusive unitized design 10' to 80' lengths. Write for UNITABLE Bulletin now.
CONVEYOR SPECIALTY COMPANY INC.
36 Newport Avenue
North Quincy 71, Mass.

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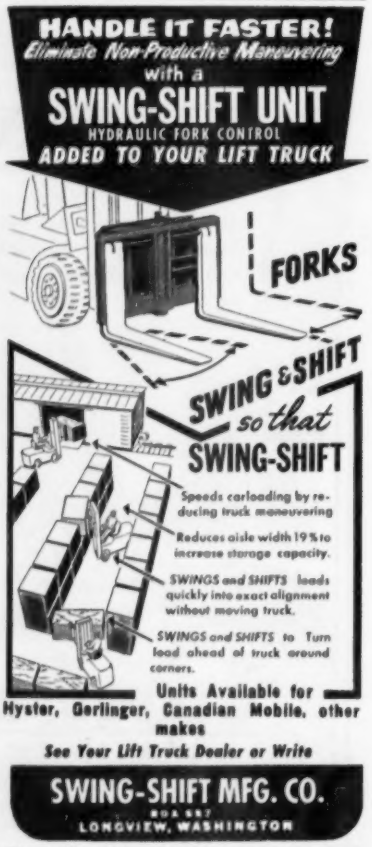

HANDLE IT FASTER!
Eliminate Non-Productive Maneuvering
with a
SWING-SHIFT UNIT
HYDRAULIC FORK CONTROL
ADDED TO YOUR LIFT TRUCK
FORKS
SWING & SHIFT so that SWING-SHIFT
Speeds carloading by reducing truck maneuvering
Reduces aisle width 19% to increase storage capacity.
SWINGS and SHIFTS loads quickly into exact alignment without moving truck.
SWINGS and SHIFTS to Turn load ahead of truck around corners.
Units Available for Hyster, Gerlinger, Canadian Mobile, other makes
See Your Lift Truck Dealer or Write
SWING-SHIFT MFG. CO.
BOX 887
LONGVIEW, WASHINGTON

Circle No. 263 on Reader Service Card

Lifts Light Loads

Economy Engineering Company has developed a self-propelled lifter called the Walkie-Worklifter. Designed for light and medium duty service, the unit has a lifting capacity of 1000 pounds. It is available in many models, including a straddle base type with a lifting range of 108 inches. Standard platform models have lifting ranges up to 110 inches. The truck is said to be extremely economical.

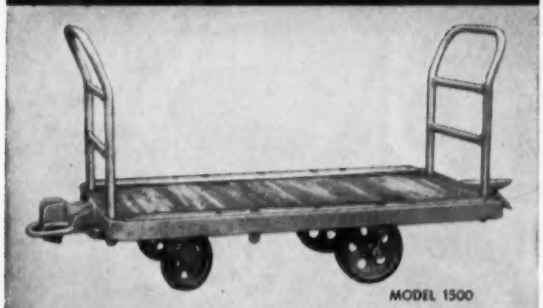
Write 393 on Reader Service Card for more information

Loads Large Bundles in Bins

Available from Beacon Machinery, Inc., is a bin loader designed primarily for storage areas where large bundles or stacks of material are received for warehouse bin storage, but is removed from the bins in small quantities. The hydraulically-operated loader may be of any length required, and will handle capacities up to 10,000 pounds. Material to be placed in the bins is positioned on the loader platform by means of a fork truck or

JAKES

America's Finest Industrial Trucks and Trailers



Literature available
Capacities from 2,000 to 10,000 pounds

JAKES FOUNDRY COMPANY
Established 1891
2800 Charlotte Avenue Nashville 9, Tennessee

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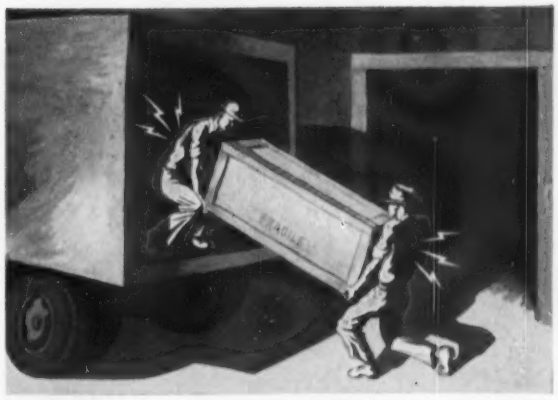


ONE LIABILITY CLAIM can cost more than a FRATE-GATE

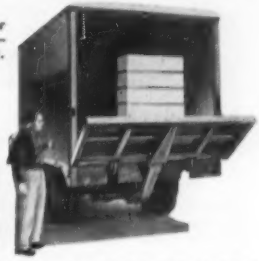
Accident records prove that *just one* claim by an employee, injured while loading or unloading a truck, can amount to far more than the total cost of mechanized handling. That's why more and more companies are installing St.Paul Frate-Gates on their trucks — to eliminate the costly hazard of hernias, smashed feet and other serious injuries that often occur when heavy loads are "man-handled".

Quickly Pays for Itself

Besides reducing the danger of lost-time accidents and damaged merchandise, Frate-Gates often cut delivery costs up to 50% . . . permit more deliveries per day without extra help or overtime. Mail coupon.

One double-acting hydraulic cylinder powers all Frate-Gate operations—lifting, lowering, opening, closing.

See us at Booth 1216, Materials Handling Show



St.Paul FRATE-GATE

St. Paul HYDRAULIC HOIST
Customer Service Dept. 36142 Main St., Wayne, Mich.

☐ Send free literature on power operated FRATE-GATE.

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SP-FG-5

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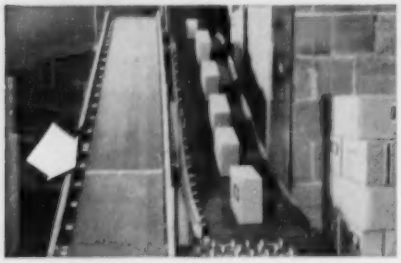
ALLIGATOR®

CONVEYOR BELT LACING



Every Tooth A Vise*

in Long Continuous Lengths for Conveyor Belts . . . . .

- ★ Excellent for Package Conveyors, Portable Loaders, Trenching and Ditching Machines, etc.
- ★ In canneries where corrosion or rust is a problem specify Alligator made of Stainless or Monel.
- ★ For magnetic separators or anti-sparking specify Alligator made of Everdur.
- ★ Separable and smooth on both sides.
- ★ 12 sizes. For belts from 1/16" to 5/8" thick—and *any width*.

Order from Your Supply House. Ask for Bulletin A-60.

FLEXIBLE STEEL LACING CO. 4702 Lexington St., Chicago 44, Ill.

JUST A HAMMER TO APPLY IT

overhead traveling crane. The loader is then picked up by either the crane or fork truck, raised vertically and moved horizontally to the required bin where it is locked by means of a quick-attachment device. The operator actuates the unit with a pushbutton and the entire load is moved into the bin. Use of the equipment is said to substantially reduce storage cost per square foot of warehouse area.

Write 394 on Reader Service Card for more information

Adjustable Tier Rack

A tier-type rack with a latitude of adjustment is available from Rack Engineering Company. It features adjustable horizontal and upright members, and may be erected quickly to suit any multiple of openings. The unit has a base of tubular and channel members, with or without heavy duty casters.

Shelves may be of masonite, steel or expanded metal. The unit is available in four base sizes, with a choice of three upright heights.

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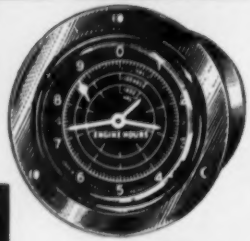
FILTER CHANGE?
TIME FOR OVERHAUL?
OIL CHANGE DUE?
NEEDS LUBRICATION?



Do you KNOW when protective maintenance is needed?

There's a RIGHT TIME for protective maintenance . . . and the HOBBS HOUR METER tells you when. Lift trucks and other powered equipment are subject to less down-time and last longer when maintenance is done ON TIME.

Not a Revolution Counter

This electric timing instrument shows HOURS and MINUTES of engine operation. No revolution counter can provide the accuracy needed for genuinely effective on-time maintenance.

Approved by Leading Manufacturers

Installed as original equipment or recommended as approved accessory by leading materials handling equipment manufacturers. Ruggedly built. Easy to install. Low in price. See your factory branch, representative or distributor . . . or WRITE:

HOBBS Engine Hour METERS

New and improved through continuing engineering research

John W. Hobbs Corporation
2061 YALE BLVD. SPRINGFIELD, ILLINOIS
World's Largest Builders of Running Time Meters

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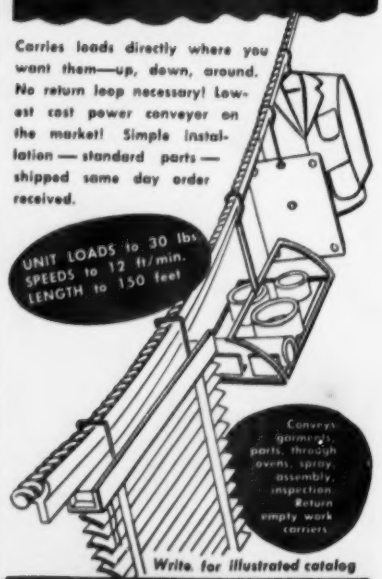
MONOFLO
The exclusive ROTATING CABLE CONVEYOR

Carries loads directly where you want them—up, down, around. No return loop necessary! Lowest cost power conveyor on the market! Simple installation — standard parts — shipped same day order received.


UNIT LOADS to 30 lbs
SPEEDS to 12 ft/min.
LENGTH to 150 feet
Conveys garments, parts, through ovens, spray, assembly, inspection. Return empty work carriers.

Write for illustrated catalog

M-H STANDARD CO.

Circle No. 207 on Reader Service Card

Switch Prevents Overload Damage

A 20,000 pound capacity Dyna-Switch has been developed by W. C. Dillon & Company, Inc. The switch prevents overload damage to costly hoisting equipment by automatically cutting out lifting power whenever the safety maximum is exceeded. This is done by means of a massive U-shaped bar of high grade tool steel, heat treated to flex millions of cycles without losing its resiliency. Attached between the load and the hoist, it trips a sensitive micro-switch whenever the bar is deflected beyond its pre-set operating point, thereby breaking the lifting circuit. The new model has a 3½ to 1 safety factor, permitting accidental overloads up to 70,000 pounds.

Write 396 on Reader Service Card for more information

Medium Duty Crane

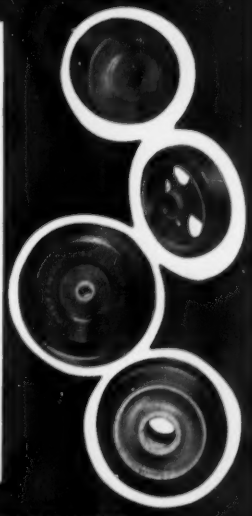
A 15-ton capacity CraneMobile is offered by Bay City Shovels, Inc. to fill the gap between smaller and larger cranes. Designated Model 151-

PHOENIX

... Source for Cured-on Solid Tires

For twenty-five years Phoenix has been manufacturing industrial solid tires. Its central location at Joliet, Illinois, assures prompt delivery... and often lower transportation charges for castings.

Modern quality control procedures assure uniformity of tread stock compounds. EXCLUSIVE WITH PHOENIX is the famed "E-Z" Rolling Tread Compound. Also available are special tread compounds, including static conducting, hard rubber and oil-resisting treads!



WRITE FOR FREE BOOKLET indicating sizes and load specifications. Address:

RUBBER PRODUCTS DIVISION

PHOENIX MANUFACTURING CO.

Joliet, Illinois

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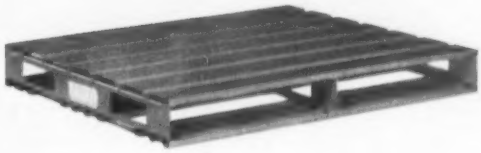
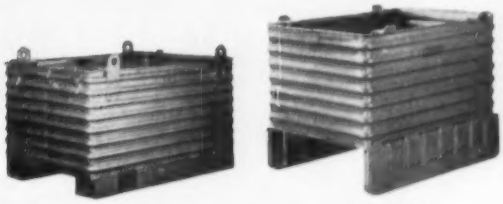
Move it or Stack it

with Brusco HANDLING EQUIPMENT

No. 930 BRUSCO PALLET



For general use in moving and stacking materials, cartons and containers. Special attention is called to large bearing surface of the bottom of the pallet. This feature assures easier and safer handling and makes the pallet adaptable for many uses. Fabricated of heavy or light gauge steel depending on your requirements. Simplicity of design and rugged welded construction make for long productive life with no maintenance cost. Can be furnished with or without fork openings for 4-way entry.



No. 558 No. 559

BRUSCO Corrugated Skid Boxes

Also manufacturers of:

BOXES - SKIDS - PALLETS - RACKS

BRUSCO self dumping hoppers

When requesting price information, please give dimensions, load capacities and quantities.

Brusco HANDLING EQUIPMENT

BRUMMELER STEEL PRODUCTS CORP.

1410 Ionia Ave., S. W., Grand Rapids, Mich.

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WHAT A LIFT!

GRAND STANDARD TELESCOPE

LIFT-KING

WORLD'S MOST VERSATILE LIFT STACKER WITH A 100" LIFT...

1500 lb. Capacity—Electric or Battery Powered-Fingertip Control • Platform or Fork Lift

Easier • Faster

LIFTING • MOVING • HAULING • STACKING • UNLOADING

Reduces-Saves

MANPOWER • FATIGUE • ACCIDENTS • DAMAGE • COSTS

54 Different GRAND LIFT KING models designed for floor level Loading and Unloading at Trailer Tailgate Height or for Stacking Drums or Cases. Quality Products Since 1921 • Quality Service.

ALLIED MFG. & SALES CO.
Materials Handling Equipment Div. of GRAND SPECIALTIES CO. • 3181 W. Grand Ave. • Chicago 2, Illinois

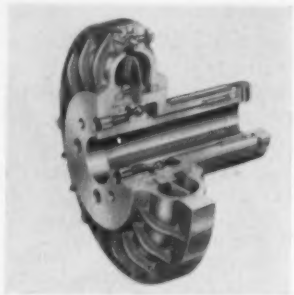
Send for Complete Catalog and details on 10 day Free trial Demonstration Plan.

T41, it is powered by a 404 cubic inch displacement Hercules gasoline engine. Featured are single front wheels and dual tandem rear wheels, 182 inch wheel-base, 12 forward speeds to a maximum of 44 mph and three reverse speeds, front and rear extendable outriggers and 30 foot boom. Crane machinery and engine are mounted on a full-length, one-piece, heat-treated, alloy-steel casting said to have exceptional resistance to shock and impact stresses.

Write 397 on Reader Service Card for more information

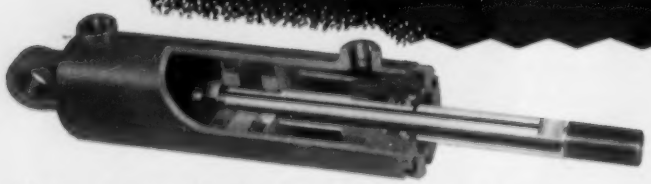
Here's A Dry Fluid Drive

A new development in industrial power transmission, called Flexidyne, and described as a dry fluid drive, is announced by Dodge Manufacturing Corporation.



Based upon a completely new principle, Flexidyne easily handles difficult starting and reversing problems, and gives a new kind of protection against shock and overloads, it is claimed. At normal operating speeds it does not slip, but in case of an overload it is slippage which gives

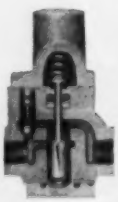
Custom-built for ANY industry
BHEW HYDRAULIC CYLINDERS



Efficient, compact BHEW hydraulic cylinders are built on order, to the specific requirements of any industry or special application. Small O.D. and retracted O.A. length, any type mounting for 1,500 psi and 3,000 psi operating pressures and up to 156" stroke.

Visit BHEW
BOOTH 1956
at the Show

Lift trucks need the BHEW Pressure-Operated Hydraulic Flow Control Valve. Eliminates surge as load starts down . . . load weight controls rate of decent.



BENTON HARBOR ENGINEERING WORKS, Inc.
BENTON HARBOR, MICHIGAN

Circle No. 72 on Reader Service Card for more information

BOWERS
BATTERIES
Always Better
BOWERS BATTERY & SPARK PLUG CO., READING, PA.

Circle No. 73 on Reader Service Card

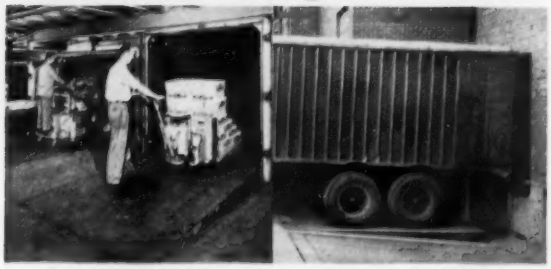
protection, says the manufacturer. The drive is made up of a housing, inside of which a rotor is free to turn concentrically. Between the two are fine particles of spherical steel shot, called the flow charge, which acts very much like a fluid. The flow charge transmits power from the housing to the rotor.

Write 398 on Reader Service Card for more information

Warehouse Truck With Retractable Forks

A warehouse truck with forks that reach out to pick up and deposit loads is available from The Yale & Towne Manufacturing Company. In operation, hydraulically operated extendable forks slide forward beyond the truck outrigger wheels when placing or picking up a load. This faculty does away with the necessity of straddling the bottom load and requires only enough underclearance to permit fork entry. When a load is picked up the forks retract against the carriage for transportation. Hydraulic tilting at any carrying height further increases load stability, according to the manufacturer. Push buttons located near the

For An Efficient And Low-Cost Solution To Any Dock Leveling Problem



Specify the adjustable ROWE ADJUST-A-DOCK or ROWE ADJUST-A-TRUCK

84 Models to Meet Your Requirements

- **Low initial, installation and operating cost**
- **Simple and easy to install and maintain**
- **Dependable trouble-free service**
- **Push button controlled and hydraulically adjusted**

Save money — Get details, write for our free new brochure.

ROWE METHODS, INC.

2534-C DETROIT AVENUE • CLEVELAND 13, OHIO

Circle No. 257 on Reader Service Card for more information

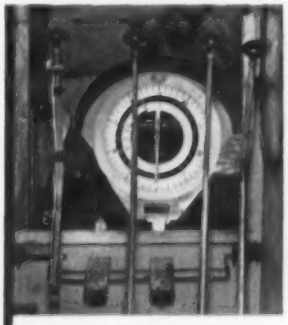
It might well be, if he lifts heavy loads by sheer guesswork — that is, without a

MARTIN-DECKER CRANE WEIGHT INDICATOR

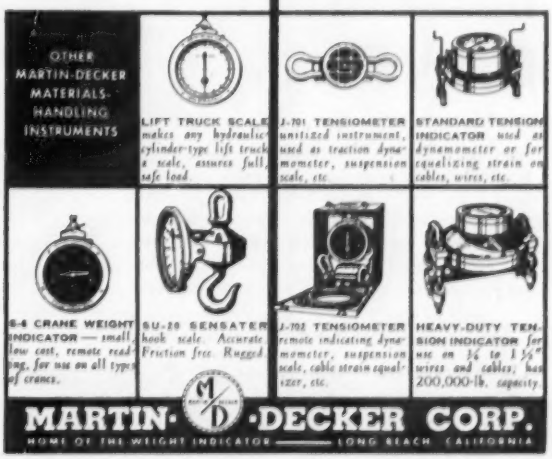
The SB-10 Crane Weight Indicator warns your operator of an excessive load before he actually lifts it. Stops overtaxing equipment. Prevents costly accidents.

Merely by glancing at a dial a few inches from his controls, your operator instantly knows the weight, the boom radius, and the lifting capacity. He can tally weights while he's loading.

There are models for all crane capacities. For further information write Martin-Decker Corp., 3431 Cherry Ave., Long Beach 7, Calif., Dept. N-10.



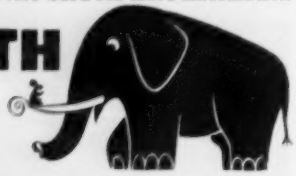
The Martin-Decker SB-10 Crane Weight Indicator tells you (1) the weight you are lifting, (2) the boom radius, and (3) the lifting capacity at that radius.

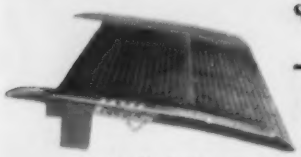

OTHER MARTIN-DECKER MATERIALS-HANDLING INSTRUMENTS
LIFT TRUCK SCALE makes any hydraulic cylinder-type lift truck a scale, assures full, safe load.
J-701 TENSIOMETER unitized instrument, used as traction dynamometer, suspension scale, etc.
STANDARD TENSION INDICATOR used as dynamometer or for equalizing strain on cables, wires, etc.
G-4 CRANE WEIGHT INDICATOR — small, low cost, remote reading, for use on all types of cranes.
SU-20 SENSATER hook scale. Accurate. Friction free. Rugged.
J-702 TENSIOMETER remote indicating dynamometer, suspension scale, cable strain equalizer, etc.
HEAVY-DUTY TENSION INDICATOR for use on ¾ to 1 ½" wires and cables; has 200,000-lb. capacity.
MARTIN-DECKER CORP.
HOME OF THE WEIGHT INDICATOR — LONG BEACH, CALIFORNIA

Circle No. 200 on Reader Service Card for more information

Circle No. 212 on Reader Service Card for more information

STRENGTH
without weight . . .





built into every
MAGFAB MAGNESIUM
DOCKBOARD

Get all the advantages of high-capacity steel — at one-fourth the weight of steel — with MAGFAB dockboards. They eliminate delays . . . take on the toughest job safely, with effortless ease . . . reduce to minimum all problems of positioning, moving and storing.

Check THESE EXCLUSIVE FEATURES

Non-slip surfaces — made to famous "Inland" 4-way safety design — in both adjustable and flush types. Positive, spring-loaded locking of adjustable support. Exclusive full-length contour curb with full length hand rail. Special designs engineered in capacities to 18,000 lb. All personnel well experienced in magnesium fabrication.

Full facilities for designing low-cost, extra-strength boards.

Magnesium FABRICATORS, Inc.

ENGINEERING • DESIGNING
FABRICATING
MAGFAB
LINWOOD
MICHIGAN

steering wheel control the forks. The truck is said to be ideal for use where low floor capacities and elevators are a factor because of its light weight and short length.

Write 399 on Reader Service Card for more information

Radio Guided Truck Travels Without Operator

A completely automatic tractor which travels through the plant without an operator has been introduced by Barrett-Cravens Company. The tractor moves in a steady path to its destination, at any speed desired, under automatic control at all times. Radio waves control the Guide-O-Matic truck by means of guide wires strung from the ceiling and signal boxes installed at desired locations throughout the plant. By pressing a button, the truck will travel immediately to the station from which the signal originated. Routes can vary, with many destinations served automatically.

Write 400 on Reader Service Card for more information

Farquhar POWER-BELT AND GRAVITY CONVEYORS

materials handling CONVEYORS

Farquhar fully integrated bulk or packaged materials handling systems . . . portable or permanent . . . effect direct labor savings within production operations, as well as between operations. Get the facts about Farquhar Power-Belt and Gravity Conveyors today. See for yourself how you can cut your handling costs.

Write for our "Owners Report" or Bulletin No. 400 covering Farquhar Package Handling Conveyors.

OLIVER Farquhar CONVEYORS
A. B. FARQUHAR DIVISION
THE OLIVER CORPORATION, Conveyor Dept. M-06 York, Pa.

Circle No. 122 on Reader Service Card for more information

Here's a *new* book YOU should have

JUST OFF THE PRESS
An Easy-to-use Reference Manual

Provides necessary one-the-spot information about many every day Arc Welding problems.
Contains 172 pages of practical welding data of value to department heads, supervisors, inspectors and welding operators.
Single copies $1.25 each. Special discounts on orders of 25 or more. Attach check or money order to coupon below.

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Check or Money order for $.....is attached. Please send me.....copies of your POCKET MANUAL OF ARC WELDING
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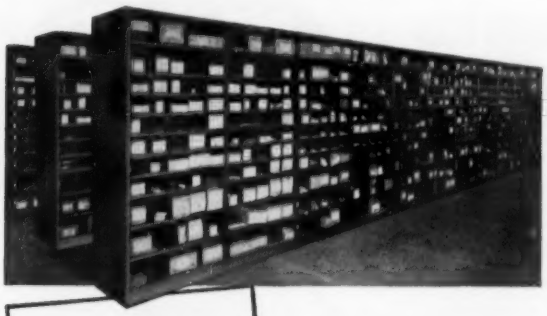
Records Loads, Service Automatically

A new model DSR Servis Recorder has been developed by The Service Recorder Company. The device records every load a truck lifts greater than 200 pounds. The load to be measured can be varied from 200 pounds to the capacity of the truck by adjusting a hydraulic pressure switch which is connected in the line between the control and the lift. After installation and adjustment are completed, it may be sealed. The recorder also shows when and how long trucks are busy and idle. This information is recorded on time charts driven by a clock-type mechanism.

Write 401 on Reader Service Card for more information

Repairs Conveyor Belt Quickly

A self-vulcanizing rubber repair material for repairing rubber conveyor belts and rubber covered electrical cables is available from Flexible Steel Lacing Co. Abrasive-resistant cover stock and rubber filler self-vulcanize by a chemical pro-



FREE
LAYOUT SERVICE
for all
storage needs

Trained Equipto engineers will lay out your storage facilities . . . suggest the number and types of units you will need . . . assure maximum use of every inch of floor space . . . increase working efficiency by expert arrangement of units. Take advantage of this free service. Ask our engineer to call, or write for catalog on complete line.

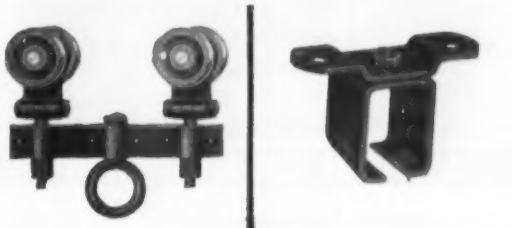
Equipto DIVISION OF AURORA EQUIPMENT CO.

805 Prairie Ave., Aurora, Illinois
Steel Shelving . . . Parts Bins . . . Drawer Units

Circle No. 53 on Reader Service Card for more information

COBURN

OVERHEAD CONVEYING EQUIPMENT
means
easy installation



The convenience and low cost of a Coburn Overhead Monorail installation make it the answer to your need for dependable materials handling equipment.

Here's why Coburn equipment is easy to install:

1. **Coburn engineers make a thorough study of your plant layout.**
2. **We submit easy-to-follow plans to you.**
3. **Your own plant personnel can install the simply designed equipment. Layout of the equipment can be changed readily because of sectional design.**

Write for Catalog #220 which contains full details on Coburn Monorail equipment and accessories to Coburn Sales and Engineering, 56 Sterling Street, Clinton, Mass.

2684

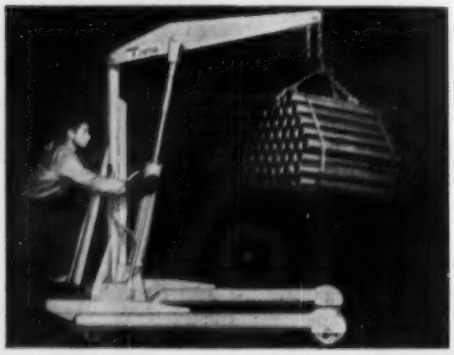
COBURN PRODUCTS
PRODUCTS OF WICKWIRE SPENCER STEEL DIVISION
THE COLORADO FUEL AND IRON CORPORATION
CF&I

Circle No. 95 on Reader Service Card for more information

Circle No. 258 on Reader Service Card for more information

Anything You Can Hang on a Hook
Can Be Easily Handled by a
RUGER CRANE

Move heavy, bulky loads easily, quickly — with *one* man and a Ruger Hydraulic Floor Crane. Capacities from ½ to 3 tons.



SUBSTITUTE FOR AN ELEPHANT

RUGER CRANES

601 West Fourth St.
UHRICHSVILLE, OHIO

SEND FOR 1955 CATALOG
Shows the complete Ruger 1955 line of Floor Cranes. Gives full specifications. Truck mounted hydraulic cranes also available. Capacities ½ ton to 2 tons, write now for your copy.

cess. Repairs can be made quickly and the belt put back into operation immediately, according to the manufacturer. No heat or heavy equipment is necessary, and it is claimed the process will add many months to the life of conveyor belts.

Write 402 on Reader Service Card for more information

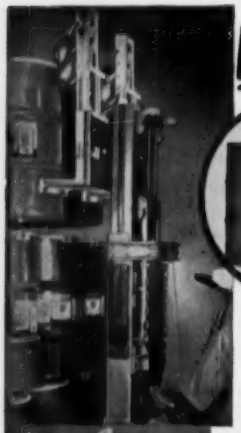
Tractor Crane Attachment

Clark Equipment Company is offering a crane attachment with a forged steel hook and double tilt cylinders for all models of Michigan tractor shovels. The double tilt cylinders are said to provide ample capacity to change the crane hook angle independent of the boom lift cylinders under maximum load conditions. Boom lengths range from three to four-and-a-half feet, with corresponding load capacities of 4000 to 7500 pounds when the vehicle is stationary.

Write 403 on Reader Service Card for more information

Smooth, Shock-Free Braking

The Dynamatic Division of Eaton Manufacturing Company is offering eddy-current brakes and associated controls for numerous and varied brak-



NOW moves 32 drums an hour with ONE MAN!*

Formerly 16 Drums an hour with overhead crane and 2 men....

THE LIFT-O-MATIC POWER TRUCK ATTACHMENT for DRUM HANDLING

- **Simple** . . . One operator can attach or remove unit, WITHOUT TOOLS, in only 2 minutes.
- **Automatic** . . . Raising or lowering truck carriage provides automatic, mechanical pick-up and release. Additional operator controls unnecessary.
- **No Pallets Needed** . . . Move, tier or place drums quickly without pallets.
- **FITS *ANY* TRUCK**

* Case history on request

Write for Details — **MARVEL INDUSTRIES, Inc.** 2276 CLEVELAND ST., EVANSTON, ILLINOIS

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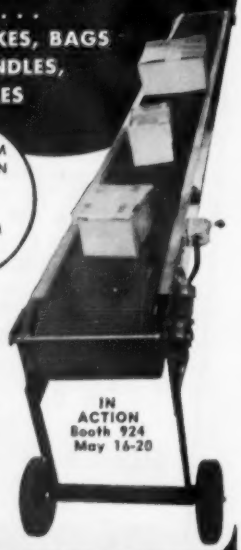
NEW LONDON
"Cost Cutter"
CONVEYORS
Light • Low Cost • Versatile
for . . .
BOXES, BAGS
BUNDLES,
BALES

14' ALUMINUM MODEL SHOWN
$484
OTHERS FROM
$340



Electric or gasoline drive. Other flat and trough belt conveyors for inclined or horizontal applications.

IN ACTION
Booth 924
May 16-20

Write for Catalog

NEW LONDON ENGINEERING CO.
New London, Dept. F, Wisconsin

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Circle No. 228 on Reader Service Card for more information

BEAM BUTANE-PROPANE CARBURETION

Makes ANY Gasoline Engine RUN BETTER- LAST LONGER- and Cost You LESS!

FORK LIFTS
TRACTORS
BUSES
TRUCKS
AUTOS
STATIONARY ENGINES

Best Buy BEAM! **THE PARKDALE COMPANY**
Manufacturers of BEAM LPG PRODUCTS
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it costs you LESS

TO HANDLE SMALL METAL PARTS WITH A MAGNETOOL!

The amazing new hand Magnetool performs a variety of cost-saving operations never before possible! Instant pick-up and release of small parts! Separates steel parts from non-ferrous metals . . . removes steel particles from food, textiles, and chemicals . . . speeds handling of heat treated material and simplifies pick-ups of extremely hot or cold parts. There are many ways you can cut handling costs with Magnetools! Alnico Permanent Magnet—no batteries—lasts indefinitely. *Write today for literature on the complete line of Magnetools.*

MAGNETOOL Div., Multifinish Mfg. Co.
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Detroit 19, Michigan

Model 74
8-9 lbs. capacity
$75.00

Model 72
4-5 lbs. capacity
$38.00
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Model 71
2-3 lbs. capacity
$19.75

MAGNETOOL® DIVISION OF MULTIFINISH MFG. CO.
Manufacturers of Magnetic Tools, Rotary Floor Sweepers, Tank Rotaries

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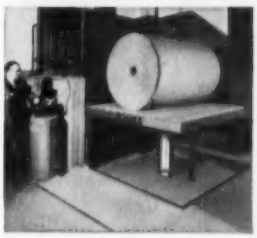
SPEED MATERIAL HANDLING with JOYCE HYDRAULIC...

...MATERIALIFTS



save floor space... save manpower

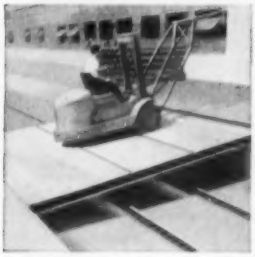
Joyce single or multiple post "Materialifts" will be engineered to fit your requirements as to size and type of platform, lifting capacity and type of controls. Available with air-oil or electric pumping unit operation . . . always locked on oil for greatest safety.

...VARI-RAMPS

simple to install... economical to operate

These compact units feature roll-over capacities to suit. Available in two types . . . electric pumping unit and air-oil operated . . . push button, hand or foot valve control . . . automatic leveling. Joyce "Vari-Ramps" are manufactured with platform sizes and vertical movements to your specific requirements.

...CROSS-OVER BRIDGES



custom built to meet your requirements

Joyce cross-over bridges are available in the following styles, Bascule type, Vertical rise type and Horizontal rotating type. They are available with platforms of shape, size and capacity to meet your requirements . . . full hydraulic air-oil or electric pumping unit operation . . . push button, hand or foot valve control.

See Us at Booth 1123

6th National Materials Handling Exposition
Chicago, May 16-20

WRITE TODAY FOR COMPLETE INFORMATION!

JOYCE MATERIALIFTS

IN CANADA: Midland Foundry & Machine Co., Ltd., Midland, Ontario

THE JOYCE-CRIDLAND CO.
DAYTON 3, OHIO

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CAN YOU THINK OF A BETTER WAY TO HANDLE MATERIALS?

CONVOY'S CHEMBOARD* SELF-STACKING TOTE BOXES MAY BE YOUR ANSWER

Convoy Boxes are LOW COST, STRONG and LIGHT WEIGHT . . . are made in a wide range of stock sizes and shapes. They weigh and cost less than 40% of steel.

*Chem-Board is Convoy's chemically impregnated corrugated board . . . flint-hard, rock-strong.

Here's an example of Convoy Self-Stacking Boxes speeding production, conserving space, saving money.

GET IN TOUCH WITH
CONVOY, INC.
CANTON 6, OHIO
P. O. Station B, Box 216-F

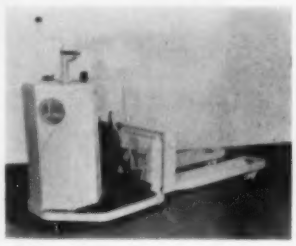
STANDARD AND CUSTOM-MADE NESTING, STACKING, and VERTICAL-SIDED CHEM-BOARD TOTE BOXES

ing requirements. A wide range of sizes and designs is available. The brakes, either air or liquid cooled, have no mechanical contact between the rotor and stationary field, thus assuring smooth and shock-free operation, according to the manufacturer.

Write 404 on Reader Service Card for more information

Pallet Truck Transports Goods and Operator

Recently introduced by The Colson Corporation is a double faced pallet type electric rider truck. Called the Handler, the truck is controlled by a single lever, has two speeds forward and reverse, and shifts automatically. Pallets are lifted by raising the control lever, and brakes apply automatically when the operator lets go of the control handle. The 4000 pound capacity truck travels at speeds up to 4 mph, is 29 inches wide, and has a steering arc of 200 degrees.



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Packaged Pneumatic Tube System

A "packaged" Airtube System that eliminates time wasted by personnel running back and forth

designed for every need
built for longer service

BRONCO
INDUSTRIAL WHEELS

"with the tire that won't roll off"

General purpose, special service, spoke or disc type . . . no matter what your needs Bronco Industrial Wheels are designed to meet your requirements. Only with Bronco do you get tough, lightweight, aluminum construction with rubber tires molded on by Bronco's exclusive bonding process.

BRONCO
magnesium
BRIDGE RAMPS

Easy to handle Bronco carloading or truck ramps will speed up loading and reduce handling costs. The exclusive "Underside Design" of Bronco ramps provides greater strength, longer life, minimum weight and a low initial cost.

Write today for your illustrated brochure on Bronco Industrial Wheels or Bronco Ramps

BRONCO PRODUCTS CO. 717 Stanford Ave., Los Angeles 21, Calif.

Circle No. 82 on Reader Service Card for more information

MULTITON roller skids
moves machinery & heavy loads
6 TIMES FASTER

- Steers while it moves!
- Unlimited Carrying Capacity
- Self-Laying Track
- Light Weight

another
time-money saver...
THE MULTITON MOVING WAY!

Man maintains desired direction of travel by steering swivel type Multiton Roller Skid while load is moving. Saves man-hours; reduces down time. Write for Catalog.

See the Multiton at the 6th National Materials Handling Exposition Chicago — booth 1947 May 16-20th.

STOKVIS EDERA & CO. INC. 18 Secatoag Ave., Dept. B Port Washington, N. Y.

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Circle No. 233 on Reader Service Card for more information

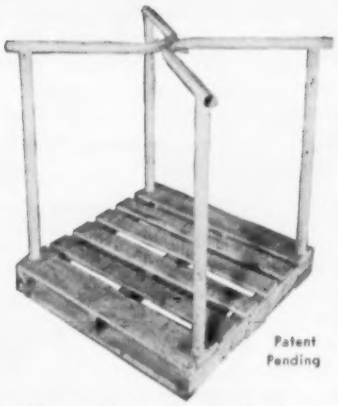
TIER-RACK

The New Approach to Palletizing

CRUSHABLE ITEMS

—

IRREGULAR SHAPES



Patent Pending

The Economical Tiering Device that Converts Your Regular Pallets to Racks

- No bolts—no special attachments—frames simply snap onto your present pallets
- Completely supports load from corner to corner—safe—simple for truck operator to place one on top of another
- Items can be removed from one pallet without disturbing load above

For Further Information Write or Call These Offices

J. R. PERKINS LUMBER CO., Fullerton Bldg., St. Louis

SOUTHERN LUMBER AND MANUFACTURING CO.

855 Avenue of the Americas, New York, N. Y. • Ellijay, Georgia

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"Ceiling Unlimited"

when you use

FLEXA STEEL FRAMING

Flexa supplies the answer to a difficult stocking problem for a large midwestern manufacturer. 136 skids of 3000 lbs. each in 25% of the floor space formerly used. Let Flexa tackle your warehousing problems.

New: Lok-Rak A self-locking steel rack that is easy and quick to assemble. See Lok-Rak at Materials Handling Show Booth 1533.

FLEXA STEEL PRODUCTS, INC.

15 North May Street • Chicago 7

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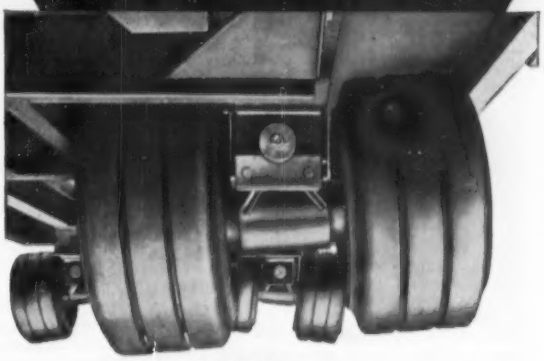
ARTICULATED AXLES

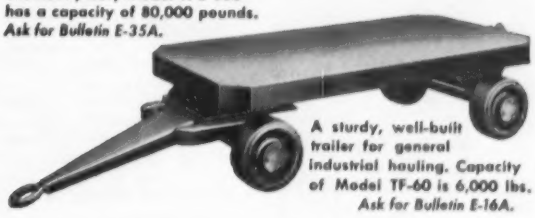
Carry Heavy Loads *SAFELY* OVER ROUGH TERRAIN



Phillips *Industrial* TRAILERS

Phillips ruggedly built trailers are available in capacities from 6,000 to 250,000 lbs., with articulated axles as shown above. Pulled singly or in train, they answer any hauling problem.

The heavy-duty Model TFU-800 has a capacity of 80,000 pounds. *Ask for Bulletin E-35A.*



A sturdy, well-built trailer for general industrial hauling. Capacity of Model TF-60 is 6,000 lbs. *Ask for Bulletin E-16A.*

Phillips

CORPORATION

(formerly Phillips Mine & Mill Supply Co.)

Manufacturers Since 1863

13 Arch Street, Carnegie, Pa.

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MAKE YOUR OWN CRANE...

...at a NEW LOW COST!

Handle loads up to 2000 lbs., SAFELY,

easily... Buy crane beam locally—we furnish the rest... A pair of self-aligning, ball bearing Flexo-Crane trucks cost only..... $119.00 Simple instructions come with shipment.

Complete Flexo-Crane, with hoist and accessories, is also economically priced. To get full details, ask for—

BULLETIN F-128

The Abell-Howe Line includes a wide range of overhead cranes monorails, hoists and accessories.

ABELL-HOWE COMPANY 53 W. JACKSON BLVD. CHICAGO 4, ILL.

50th Anniversary Year

Bond

...for fifty years

Your Best Buy in Materials Handling Equipment

1-A Series—Stationary Caster

36-A Series—Double Ball Race Swivel Caster

Bond Self Load—Unload Drum Truck

Bond Universal Lift Jack and Platform

As Bond Foundry starts its second fifty years of service, we pledge again a constant effort to design and build the finest equipment. Whatever the materials handling equipment you need, your best buy will always be Bond.

BOND FOUNDRY & MACHINE CO.
Manheim, Pa.

1905 **Bond** 1955

For Half a Century

Prime Movers in Materials Handling

Circle No. 71 on Reader Service Card for more information

with paperwork, is available from Lamson Corporation. The system will operate from any point to any other point up to 130 feet. Said to be easy to install and simple to operate, standardization of parts allows easy future integration with conventional system, if desired. The pneumatic tubes will carry papers or small parts at a rate of 20 feet per second. You design the layout and set up the system which is supplied as a complete unit.

Write 406 on Reader Service Card for more information

Metal Conveyor for Severe Conditions

M-H Standard Company is offering a sectional metal belt conveyor to handle goods through horizontal and vertical paths under conditions which would be too severe for ordinary belt conveyors. Furnished in 10 standard widths from 12 to 60 inches wide, the conveyors are available with six inch pitch belt links, and all parts are interchangeable.

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Simple Limit Switch

Simplicity of adjustment and relative freedom from maintenance are key features claimed for a new limit switch manufactured by Clark Door

You can provide easy mobility to a variety of industrial products with

IRONBOUND ALL-PURPOSE HANDLING UNITS . . .

POPULAR IRONBOUND FLO TRUK

● An easy to handle ruggedly constructed unit for carrying bulky and heavy loads at lowest cost. Seven standard sizes with one or two push handles makes it easy to select the proper truck for your requirements. Ask an Ironbound engineer for suggestions.

The HANDY for furniture and similar items.

The HAULER for cases, crates, tote boxes, etc.

The HUSKY for general use throughout the plant.

THE IRONBOUND "SAFETY-SKID" WITH ROUND CORNERS

Ironbound construction assures long hard use with complete safety to product and operator. Still the time proven method for handling of materials efficiently and economically.

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BOX & LUMBER COMPANY
Materials Handling Division
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MANUFACTURERS OF QUALITY BUILT SKIDS, SEMI-LIVE SKIDS, FLOOR TRUCKS, ROLL TRUCKS, DOLLIES AND PRY BARS

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A NEW

LIGHTER, QUIETER
POWER PACKAGE

TULSA®
POWER
TAKE-OFFS

Light, compact, durable, quiet — that's the story of the new TULSA POWER TAKE-OFFS . . . The heat-treated aluminum alloy housings permit more payload . . . Compact design saves installation man-hours . . . Quality and durability of gears, shafts, and yokes are assured because of "controlled atmosphere" carburizing and hardening . . . As an extra refinement, all gears are shaved resulting in extremely quiet operation. And last but not least, prices are very low. One-speed forward and two-speeds forward models, all reversible, are available for every power take-off application.

Tulsa® Winch
TULSA, OKLAHOMA
DIVISION OF VICKERS Inc.

LANGE Hydraulic LIFT
VERTICAL LIFT
from 6" to 30"

LIFTS STRAIGHT UP

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TOP SIZE
24" x 60"
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CAPACITIES
1000 to 6000 LB.
STANDARDS
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LOWERS TO 6"
RAISES TO 30"
•
WEIGHT APPROX.
375 LBS.
•
OTHER MODELS
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FOOT, HAND
ELECTRIC AND
AIR-POWERED
MODELS
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HUNDREDS OF TIME-SAVING USES
RECESSED TO FLOOR LEVEL
PERMANENTLY BOLTED DOWN
LEFT FREE TO SLIDE ANYWHERE
MOUNTED ON WHEELS
for loading and unloading • positioning
machine feeding • materials handling
die handling • conveyor applications

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Keeps work at work-height as a feed table. Supports and levels sheets and bars. Transports dies. Rotation Lock holds any position while top remains free to move up and down. Top 30" x 30". Table height lowered 27", raises to 45".

MODEL L-1000 Standard Capacities of 1, 2, 3, 4, 5 and 6000 LBS.

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4275 N. 124TH ST. • MILWAUKEE 10, WIS.

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SAVES $15,000 PER YEAR

A FLEXIBLE
EFFICIENT
STORAGE
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FOR
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APPLICATION
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AND NEVER
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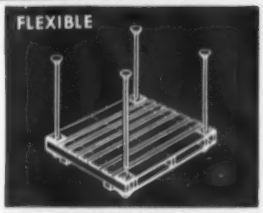

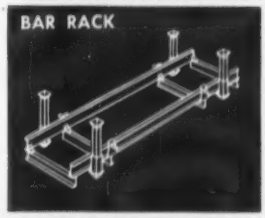

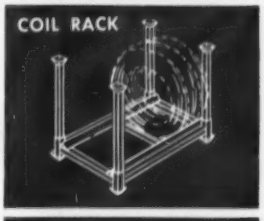

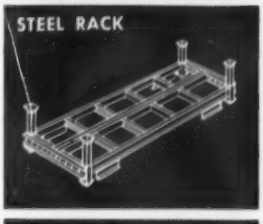

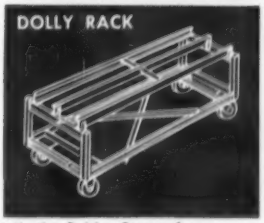

This booklet tells the Paltier Story of saving storage space. . . . Ask for it today!

THE PALTIER CORP.
1709 Kentucky St., Michigan City, Ind.

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Circle No. 161 on Reader Service Card for more information

SAVE MONEY.. You can save money with the new Electric Hoist-O-Matic Model 1000. One man can do the job of 2 or more with Hoist-O-Matic's unique push button operation. The operator has complete finger tip control at all times . . . and from a distance of 8 feet if needed. Requires only 18" x 23" of truck bed area and 5 mounting holes. Quickly and easily handles loads up to 1000 lbs. Four foot boom swings 360° Hoist-O-Matic is equally efficient for skidding as well as hoisting operations . . . and the truck driver can handle them all.

You'll be wise to get the "Money Saving Details" today.

See the HOIST-O-MATIC at the MATERIAL HANDLING EXPOSITION in Chicago May 16 to 20.

MANUFACTURERS' AGENTS AND DEALERS' INQUIRIES INVITED.

Hoisters INCORPORATED
1913 Broadway • Kansas City, Mo.

Company. Suitable for many applications where critical control of limits is required, limits can be adjusted by means of only two slotted screws. This can be done while equipment is in operation, and there is no need for disengagement of gears. Designed primarily for use with Clark's automatic door operator, the switch is adaptable to many types of industrial usage, including special electrical requirements.

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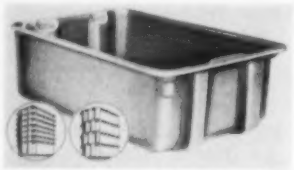
Pan Nests and Stacks

A Plexton Stack-n-Nest pan has been developed by G. B. Lewis Company which features nesting and stacking for greater versatility. Each end of the pan is formed to a different contour offset. When pans are alternated, safe, level stacking is achieved, according to the manufacturer, and each pan is interlocked to its mate. By keeping similar ends together, the contour offsets match and the pans nest deeply. Made of fiber glass reinforced polyester, the units are extra thick at stress points and further reinforced with a steel rod imbedded in the contour grip top rim. They will not dent, warp, rot or soften, it is claimed, and may be obtained in various colors.



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FOR **RUGGED DEPENDABILITY**

There's no caster job too tough for the rugged, heavy-duty Hamilton Air-Flo!

Cast steel top plate and yoke—heavy plate steel legs—1" diameter king bolt—double raceways, precision machined—wide-faced roller bearing wheels—hardened and ground spanner bushings—these are some of the features that make Air-Flo the dependable caster buy. Wheel sizes from 5" to 10" diameter—semi-steel, rubber-tired or molded plastic.

The Air-Flo is just one of many types of Hamilton casters—a model and size for almost every industrial purpose. Ask for catalog showing the complete line.

THE HAMILTON CASTER & MFG. CO.
1672 DIXIE HIGHWAY, HAMILTON, OHIO

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WEIGH MATERIALS ON THE SPOT!

With the DILLON Weight Indicator, loads are checked on the spot as *they are moved*—the instant they are lifted. No need to pick materials up, move them to a scale, set them down and then pick them up again—no more double handling or high operational costs.

Accuracy is guaranteed to be within ONE division or less at any point on the dial. Adjustable for large tare loads. 16" dia. dial. Swivel hook. Accidental overload and shock protected. 5 capacities from 0-250 pounds up to 0-5000 pounds. Portable—weather-proof—dust-proof. Each unit calibrated with certified dead weights. Extreme utility at LOW cost!

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14620Q Keswick St., Van Nuys, (suburb of Los Angeles) Calif.

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Distributor Since 1912 Continues to Expand

Ohio's first material handling equipment distributor, Ohio Equipment Company, announces the appointment of four key sales personnel. E. M. "Abe" Abramson, president and active head of the firm, points with pride to the company's record of 44 years of continuous service and expansion.

"The new staff men—Maurice J. Bernet, Jr., William D. Coakley, Arthur A. Kozsey and F. X. Schaut, Jr.—have added vitality and progressive ideas to the organization", says Abramson, who celebrates his 70th birthday this year. Manufacturers represented by the firm include Economy Engineering Company, Samuel Olson Manufacturing Co., Inc., Rack Engineering Company, Rack Hydraulic Equipment Corporation, Thomas Truck & Caster Company and The Lanham Skid Company Division of Thomas.

E. M. "Abe" Abramson

M. J. Bernet

W. D. Coakley

A. A. Kozsey

for short handed plants . . .

a helping hand

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38 Grove St., Mendota, Illinois

6 National Materials Handling Exposition

BOOTH 2040 2042

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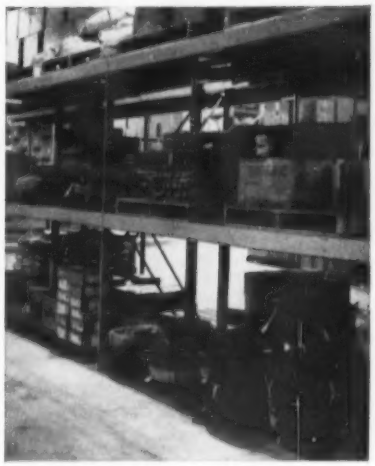

regardless of shape with BUTLER pallet racks

You'll make every foot of warehouse space work twice as hard—with Butler steel pallet racks. Palletize goods with an unlimited assortment of shapes. Stack 'em on Butler racks right to the rafters—and every pallet will be accessible without shuffling obstructing pallets around. Butler steel pallet racks save costly time—and expensive warehouse floor-space. Let Butler materials handling engineers help you solve special warehousing problems. Mail coupon below today.

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970A Sixth Ave. S.E., Minneapolis 14, Minn.
1016 Ave. W, Ensley, Birmingham 8, Ala.
Dept. 70A, Richmond, Calif.

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Address _____

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On Electric
MATERIALS HANDLING
EQUIPMENT

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Baker 3000#	$1900.00
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Yale & Automatic 6000#	$2175.00
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Yale 2000#	$1475.00
Elwell Parker 4000#	$1875.00
Mercury 4000#	$1875.00
Crescent 1000#	$1000.00
Pallet Transporters	
Automatic 4000#—48" Forks	$ 595.00
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Yale Hi-Lift Platform	$1275.00
Yale Low Lift Platform	$ 875.00
Automatic Low Lift Platform	$ 500.00
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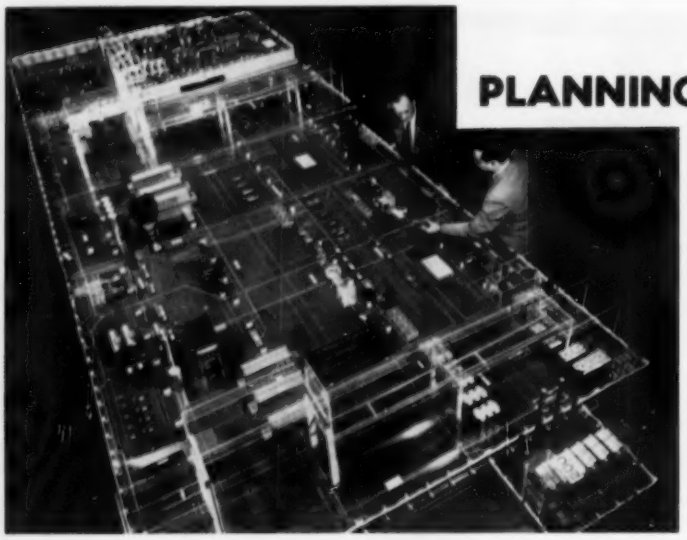
Graduate Mechanical Engineer with 20 years of gravity and power conveyor design and sales engineering experience desires sales opportunity. Write c/o FLOW, Box 5455.



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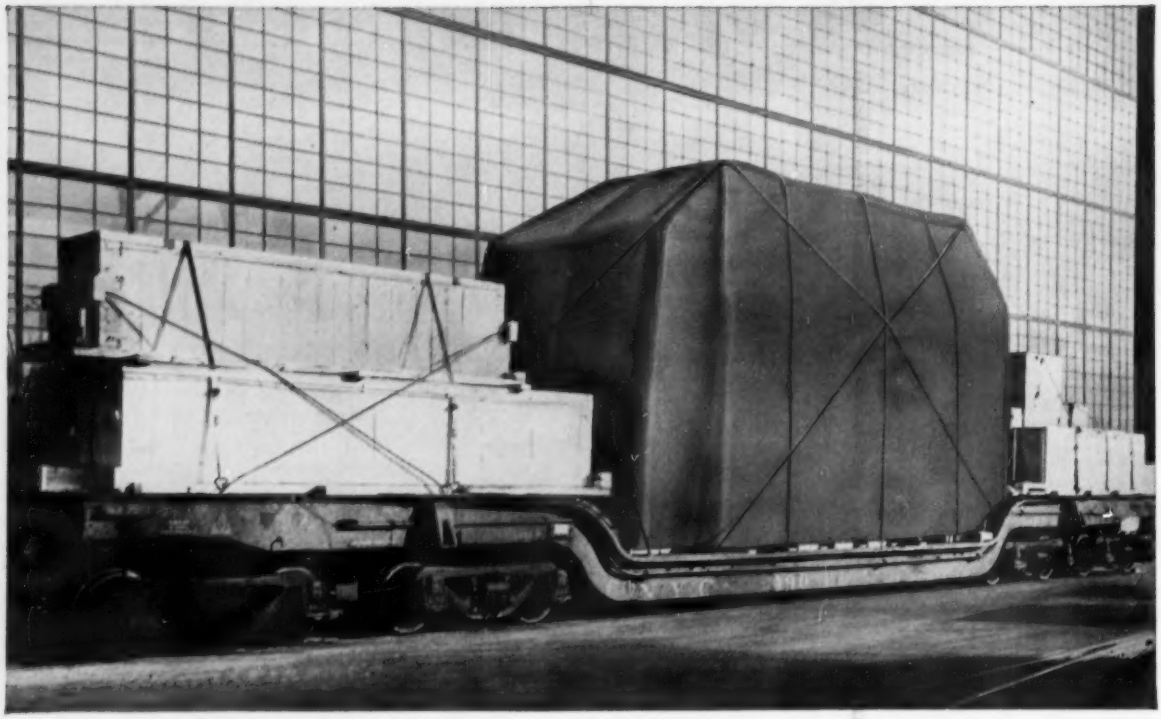

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*Pat. Pend. **Pat. No. 2659914

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